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The Wilson Bulletin

A Magazine of Field Ornithology

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THE WILSON BULLETIN

A QUARTERLY MAGAZINE OF ORNITHOLOGY

Published by the Wilson Ornithological Club

Vol. L MARCH, 1938 No. 1

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A STUDY OF THE HOME LIFE OF THE EASTERN BELTED KINGFISHER[1]

BY HENRY MOUSLEY

The present study of the Eastern Belted Kingfisher (*Megaceryle alcyon alcyon*) was made on the same ground as that of the Black Duck (*Anas rubripes tristis*)[2] in 1935, except that the position of the nest was to the north of the two large meadows mentioned, instead of to the south, as in the case of the Black Duck. In addition, the obstacles now encountered were far greater than those described in 1935, to say nothing of the length of time involved in watching, rather over ten weeks instead of four. To commence with, the birds had selected for their home the north bank of the most evil smelling stream it has ever been my misfortune to sit near, my hiding place behind a large tree being only thirty-five yards from the nest, and much nearer to the stream which made a bend at this point. In addition two large dumps, in the making, lay to the north and east of the nest, which was approached by several footpaths across the meadows. Two of these paths unfortunately passed in close proximity to the nest, and were used by men, women, and children whilst carrying old iron and other scrap materials from the dumps to their homes on the west side of the meadows. The boys, as might be expected, proved the greatest menace, since they persisted in loitering near the stream with their loads, climbing trees, lighting fires, shouting, and making things generably disagreeable, not only for myself, but for the birds as well, which fortunately were afraid to enter their nesting hole whilst they were about. Add to all this the fact that the nest had to be opened up at various times for the inspection of the young, and it is little short of a miracle how it escaped detection for over ten weeks.

The nesting site already mentioned was on the north bank of the stream, the entrance hole, Fig. 1, being three feet above the water level, and one foot below the top of the bank, which at this point was

[1]Read by title at the Annual Meeting of the American Ornithologists' Union, Charleston, S. C., November 17, 1937.

[2]Birth of a Black Duck Family, Auk, Vol. LIII, No. 4, 1936, pp. 377-80, 2 pls.

overshadowed by a belt of large trees on each side of the stream, Fig. 2. There were no cock-burrows as are sometimes made by the male. I first discovered the hole on May 11 (1937), the day on which boring operations were commenced, the hole on that day being excavated for about ten inches, which length had been increased to three and a half feet by May 16. This became the total length of the burrow which was determined, possibly, by a large stone on the righ-hand side—as I found out later on. At this date I had some difficulty in pushing a thin stick to the end of the burrow, the birds not having as yet bored out the hole to its full diameter of four inches, or cleaned out the soil they had loosened. This, as near as I could tell, was completed by May 23, and the six eggs laid between that date and May 31, the day on which I judged incubation to have commenced, and which lasted until June 23, a period of twenty-four days, before the young hatched. On that day I was only able to spend about an hour at the nest, during which time the young were fed on an average of once in every nine minutes, and this by the male alone. Meanwhile the female brooded the young, and left the nest only after the last visit of her partner. The day following, however, I spent seven hours at the nest, during which time the young were fed twenty times, or on an average of once in every twenty-one minutes.

On one occasion the male remained five minutes in the nest after feeding the young, and on another, the female lingered for seven minutes, during which times it is possible the young were brooded by each parent. On one occasion, they were both absent from the nest for sixty-one minutes. During the next two days I spent eleven hours with the birds, five on the 25th, and six on the 26th. The young were then fed thirty-three times, or on an average of once in every twenty minutes. On both these dates the parents were never in the nest for more than two minutes at a time, brooding apparently being practically abandoned. Twice on June 26, both parents together were absent from the nest for ninety-seven minutes at a time. Up to this point it had struck me that the male was the most attentive as regards feeding his offspring, and I had ample proof of this on the 26th and again on July 4—referred to later on. On the former date, the feeding grounds of the male lay to the left, and those of the female to the right of the nest, and no deviation of this rule was made during my six hours of watching, the male feeding on thirteen occasions, and the female on five only, out of a total of eighteen.

It was on this date also that an amusing incident took place, when three cows came and stood up at the edge of the bank right over

FIG. 1. Nesting Hole of the Belted Kingfisher.

FIG. 2. General view of Kingfisher Environment.

the nesting hole, whilst two others contented themselves by lying down also right across the tunnel and nesting chamber. At first I thought of driving them off, but luckily decided to leave them alone and see what would happen on the return of the parents, both of which came back together. What happened then I shall not readily forget, as they made the grove ring with their united rattlings, so much so, that I was afraid the noise would attract some of the boys. First one and then the other would fly directly almost to the mouth of the hole, but instead of entering it, would rise up suddenly and fly over almost touching the backs of the three standing cows, in an endeavor to frighten them away, whilst rattling all the time to show their displeasure at this intrusion of their home ground. Thinking the noise might attract undesirable visitors, and seeing the birds would not enter the hole, I drove off the cows, when peace reigned once more and feeding operations were resumed. Later on, one of the cows decided to return and lie down right across the nesting chamber, and I let it remain to see what would happen. The birds on their return paid no attention to it whatever; so it must have been the three standing cows at the very edge of the bank and right above the entrance hole that annoyed the birds, and caused all the commotion in the first instance.

Regarding the approach to the nest, the birds would always give notice of their coming by a series of the well known rattling notes—which could be heard a long way off—before alighting on one of four perches in the grove of trees, prior to entering the nesting hole. Unfortunately, the favorite perch was not visible from my "hide out", so I lost many opportunities of exact sex determination, the birds entering and leaving the hole, always head first, so quickly that it was perfectly impossible to make sure of their sex, notwithstanding the fact that the female in this species, contrary to the general rule, is brighter colored than the male, having a second band (rufous) across the breast. The approach to the hole was always direct from whichever perch they happened to be on, except on one or two occasions which will be referred to later. But the exit, without exception, was always in the same direction, to the left flying low, just above the water, and round the bend of the stream (Fig. 2) out of my sight, after which they would rise up giving vent to their rattle as they left for the fishing grounds. When alighting on the perches and suspicious, the birds went through a nervous form of motion, best described as a slowly heaving up and down of the body with crest erected, not a rapid bobbing up and down motion like that of the Spotted Sandpipers.

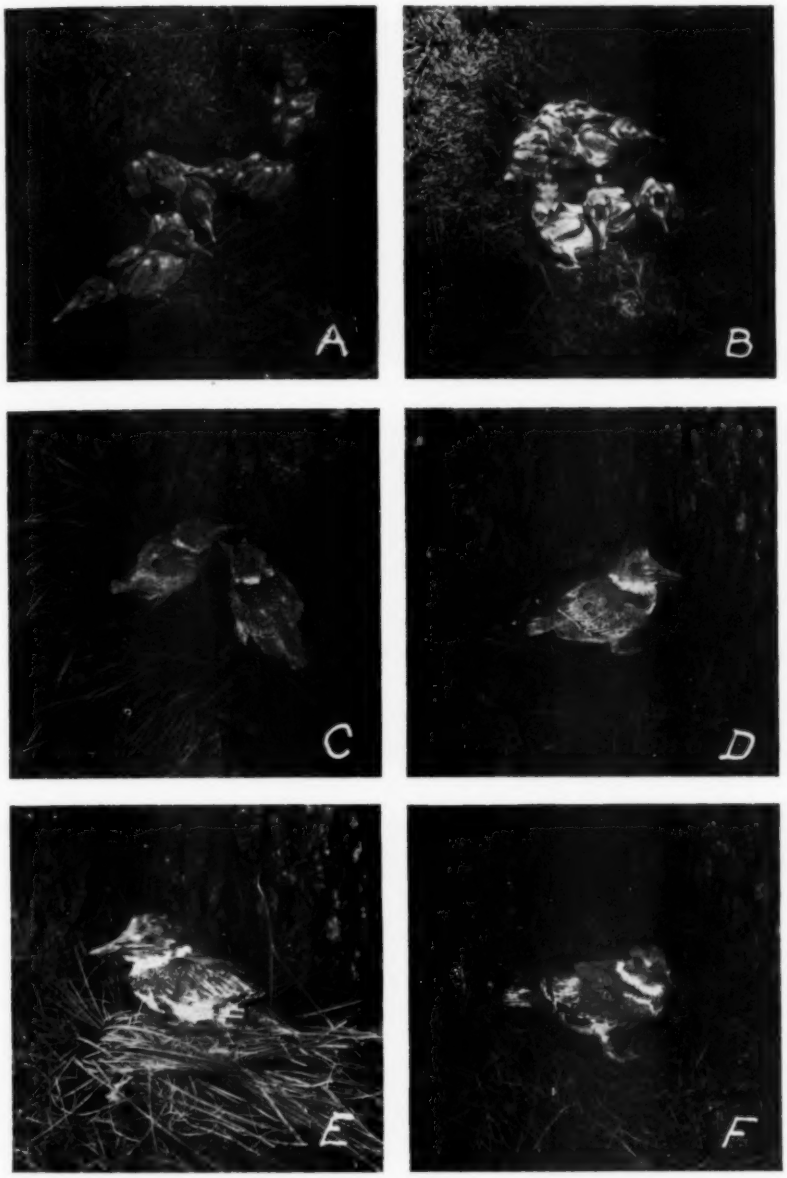

FIG. 3. Belted Kingfisher Nestlings. A and B, seven days old; C, 13 days old; D, 17 days old; E, 20 days old; F, 23 days old.

On June 28 I decided to see how late they were feeding the young, so remained at the nest from 6:15 to 8:30 P. M. (standard time). During this time the young were fed on nine occasions, or on an average of once every nine minutes. It was on this date towards the end of the sitting, when it was so dark I could hardly see the hole, that one of the birds—I think it was the male—flew low and directly up stream round the bend and subsequently perched on a large stone in the stream nearly opposite the nest, and from there entered the hole. This procedure was reverted to only on one other date, July 4, when the male instead of coming directly up stream and alighting on the stone, first flew to one of the four perches in the trees, and from there to the stone, and then into the nesting hole. This was in the morning, however, and not at night.

On June 29 I spent a little over three hours at the nest, two in the morning, and sixty-seven minutes in the afternoon, during which time the young were fed seventeen times, or at an average rate of once in every eleven minutes. Up to this point, I had spent nearly twenty-five hours at the nest, and had seen the young fed ninety-one times, or at an average rate of once in every sixteen minutes. The male had been definitely identified as feeding the young on twenty-one occasions, and the female on twelve. It was on this date, June 29, that with the help of Mr. J. D. Cleghorn, we opened up the nest for the inspection of the young, a somewhat hazardous undertaking, and one that had to be done as quickly as possible, in view of all that has been said regarding the risk of detection.

In view of the length of the hole (three and a half feet), we decided to cut out a sod about twelve inches square and six inches deep, one foot from the face of the bank, and then dig down to the hole. Arriving at this, we were able to push our arm to the end of the nesting chamber, which was roughly nine inches in diameter, the top being only six inches below the surface of the ground, and in which were found six young. Before replacing the sod, two pieces of sheet iron had to be placed over the top of the hole, the one nearest the nest bent upwards for half its width to prevent the soil which then had to be placed on top, from getting into the nesting chamber, the roof of which was five inches higher than the burrow. The sod could then be replaced at its proper level and easily removed again at any time we wished to examine the young. This device worked well and was never discovered by anyone although the nest was opened up some ten times. Moreover, it stood the full weight of cows both standing up and lying down—as will be seen later. As mentioned, the nest

contained six young, which as near as I could judge were seven days old. They were banded by my friend, a proceeding which, considering their somewhat tender age at this date, may, or may not, have been responsible for the dire disaster which came to light the next time the nest was examined.

At the present juncture, the state of the young reminded me very much of my experience when photographing the young of the Black-billed Cuckoo (*Coccyzus erythropthalmus*)[3] in August of 1930. They were naked, lacking even the natal down so characteristic of most young birds, and like young cuckoos they omit the juvenile plumage, the first feathers being those of the adult birds which, however, do not appear nearly as early as in the case of young cuckoos. The feather sheaths also do not break open until the feathers have nearly matured (about seven days in the case of young cuckoos) and their bodies in consequence seem to be incased in what has been described as coats of mail, (Fig. 3, A and B) referred to by some as the porcupine stage. They seemed to object to the light and shivered a good deal as they crawled about when placed on the grass. After taking their pictures, which show the feather-tubes and tracts, they were replaced in the nest and were not disturbed again for five days, or until July 5. I visited the site, however, the day previous, staying nearly two hours, during which time the young were fed five times, entirely by the male as already intimated, or at an average rate of once in every twenty-one minutes. I might here mention that from June 28 to the present date, and in fact to the end of the study, the exits and entrances of the parents to the nest were so rapid that it would have required a stop watch in order to have recorded them accurately, as they rarely exceeded fractions of a minute. We will now revert to July 5, the day on which the nest was opened up for the second time—a sad event. Four of the six young were found to be dead, with one of the remaining two not in very good condition. The nesting chamber naturally was in a dreadful condition, the smell from the dead birds and the unconsumed food being almost unbearable, and it is a wonder the remaining two were still alive. But they had grown out of the porcupine stage into one more resembling a feathered bird (Fig. 3, C). Apparently the four dead ones had not survived very long after their last replacement in the nest, there being no signs of any development in their case. After thoroughly ventilating and cleaning out the nesting chamber and tunnel, the two remaining young were replaced in their home,

[3]Reminiscences of the Home Life of the Black-billed Cuckoo, Canadian Field Naturalist, Vol. XLV, No. 4, April, 1931.

with grave fears as to one of them, at least, being able to pull through. These fears were well grounded, as on again visiting the nest four days later, July 9, we noticed one dead bird at the edge of the stream. Either it had come to the mouth of the tunnel and fallen out, or else the parents had removed it. On opening up the nest, however, we were glad to find the other youngster, now seventeen days old, in fine condition, having developed considerably, and with every prospect of eventually reaching maturity. Most of the feather shafts had partially split (Fig. 3, D), the plumage now being comparable with that of the Black-billed Cuckoo at seven days old.

Three days later, July 12, things were still going well (Fig. 3, E), and this was the case on July 15, the day on which we first heard this youngster, now twenty-three days old, give vent to its rattling call; up to then no sound had been made upon its removal from the nest. Several of the sheaths to the primaries had split for at least half of their length, and the tail was also developing nicely (Fig. 3, F). From now onward to the end of the study I had to do without the help of Mr. Cleghorn when photographing—no small matter when a lively young kingfisher was concerned. Four days later, July 19, when twenty-seven days old, it was almost fully fledged, with the exception that the center portion of the sheaths to the tail feathers had not as yet split, as well as the bases of three of the primaries (Fig. 4, G). It could flutter along the ground but could not yet fly. It rattled the whole time and bit my fingers vigorously. This biting habit is acquired early. I noticed it several times. One of my pictures at the seven-day period shows them biting one another as they huddled together when placed on the grass. The following day it was able to fly a few feet, the centers of the sheaths to the tail feathers, however, were still partly closed; but those of the three primaries had split open (Fig. 4, H and I). It was again very noisy and difficult to pose even for an instant, the instinct of fear having by now become well established. On the day after, July 21, it was still unable to fly far, but had improved a little, and was much quieter, allowing me to get a somewhat uncommon picture (Fig. 4, J). This picture shows one of the wings fully expanded, with all the white pattern clearly defined. Two days later, July 23, was the last time I handled it at the age of thirty-one days, when it made a flight of twenty-five feet or thereabouts. The male parent was on the ground when I arrived, and made a great fuss, flying about and rattling vigorously all the time, to which the young responded. After taking its picture on the ground (Fig. 4, K), showing its syndactylous foot as well as the band, No. 37-404052, on

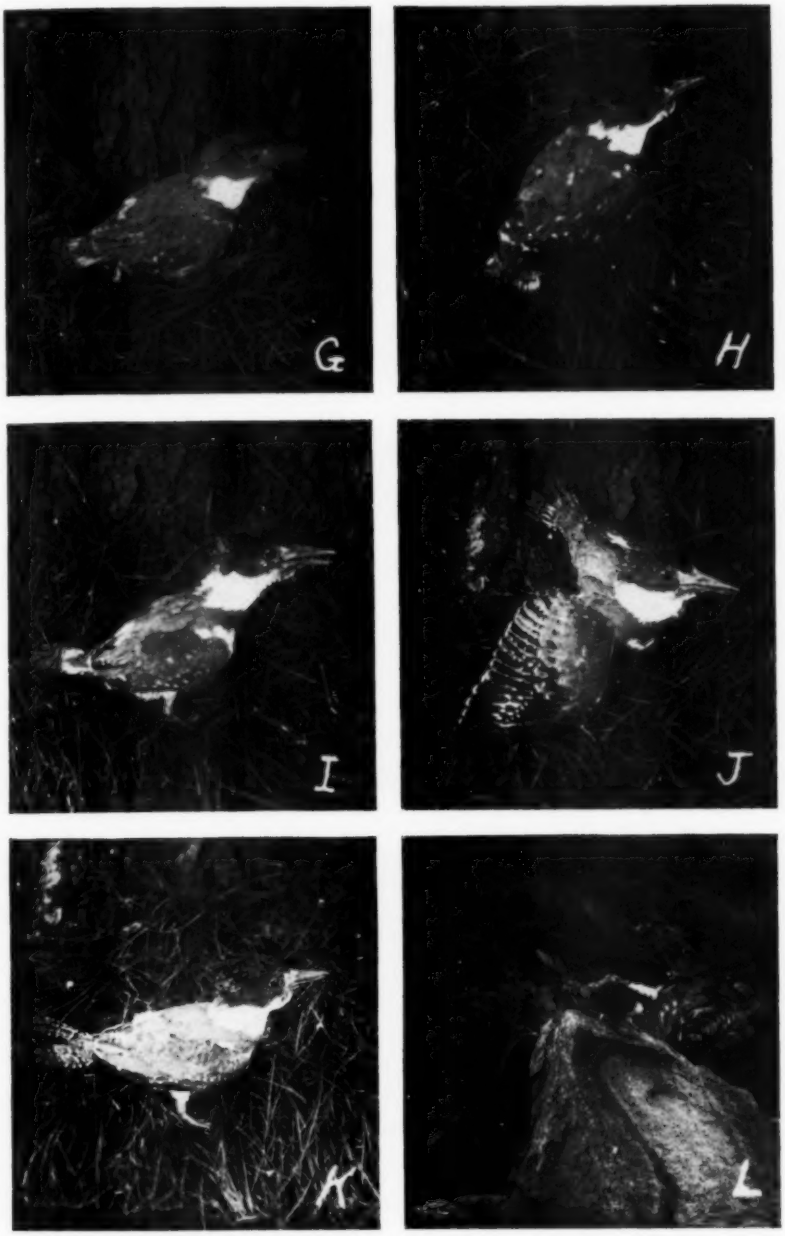

FIG. 4. Belted Kingfisher Nestlings. G, 27 days old; H and I, 28 days old; J, 29 days old; K and L, 31 days old.

the tibio-tarsus, and another after its flight, when it landed on a large stone (Fig. 4, L), I replaced it in the nest and watched the male come and feed it once. After that the parent perched in a tree for a long time whilst preening its feathers before flying away. The day following the nest was empty, so the parent no doubt had enticed the young out of the nest either after my departure or on the following day, July 24, when it would be either thirty-one or thirty-two days old, as the case might be.

In conclusion, on summing up I find forty-two hours were spent with the birds (May 11-July 24), during which time the young were fed one hundred times, or at an average rate of once in every 25.2 minutes. Of course there were periods when the feeding was much faster, as for instance, once in every 8, 9, 13, 20, and 21 minutes respectively. Sometimes the parents were absent from the nest for long periods of time, such as, 150, 120, 105, 97, 93, 90, 85, 75, 70, and 60 minutes at a time, when of course the young were without food. It was after these long spells that the more rapid feedings generally took place. As already remarked, the male seemed to pay the most attention to this part of the business, for I find of those times when I was perfectly sure of the sex of the parent, the male fed twenty-eight times to his partner's fourteen, or just double. It was the male parent which was the last seen at the nest previous to the departure of the one surviving young—a male. The food for the most part consisted of small fish, crawfish, minnows, tadpoles, and probably beetles. I may say that after the finding of the four dead young, the remains of the uneaten food suggested that some of it was too large, and such a thing as injudicious feeding may after all have contributed to, if it did not actually cause, the early demise of these four youngsters. After the first few days the time the parents remained in the nest after feeding the young could only have been decided by means of a stop watch —so rapid were the exits and entrances of the parents.

And so ended my longest study, lasting as it did from May 11 to July 24, a matter of seventy-four days. And between now and next May I am left wondering whether the birds will come back and occupy the same nesting hole again. Should they do so they will find it all in order, as I cleaned it out thoroughly before replacing the sod and closing it up for the last time. Certainly, for their own sakes, as well as for mine, they will be wise in returning, since so much preliminary burrowing and digging will be spared for both parties concerned.

MONTREAL, CANADA.

THE ALEXANDER WILSON MEMORIAL IN INDIANA

BY S. E. PERKINS III

Hidden for decades in the depths of a wooded ravine on the edge of a lapping brook; shaded both morning and evening by high hills that have been clothed with a delightful primeval forest of hardwoods and have been carpeted for ages with myriads of wild flowers, some of which, like the myrtle, furnish greenery the year round, stands vertically a five-foot pillar of native stone, unhewn except for a legend roughly carved thereon by one who was but an amateur chiselman. Though this legend is almost worn away, by chalking the shallow markings a profile of Wilson with long hair was brought out in life size near the top on the west side. Just below this were the initials, A. W. These letters were made with sweeping curves and were about four inches in height. About five inches below them was the word "Died" on somewhat smaller scale followed, near the bottom of the stone, by the date "1813". All lines of chiseling appeared to have been made with a rounded base chisel and not a pointed one.

Encircling and protecting this block of stone is an iron picket fence some four feet tall surrounding a space with a diameter of fifteen or eighteen feet. Both shaft and fence bear evidence of venerable age. The whole stands far back from even present day roads, near the picturesque entrance to Donaldson's Cave and away from the regular drives in what is now Spring Mill State Park near Mitchell, Indiana. The tract about it was formerly the "Beautiful Shawnee" and afterwards, Donaldson's Woods. Within the enclosure is a painted sign which recites:

In Memory of
Alexander Wilson
Father of American Ornithology.

This Monument Was Erected by
George Donaldson
His Fellow Townsman.

The genius for whom this stone was placed had left Scotland and the weaver's trade to round out in America a studious career. Though he arrived here with little of this world's goods, he first earned his living at teaching English. Soon his ambition to become a naturalist irresistibly asserted itself and untiringly he studied botanical forms and birds. He traveled far and wide in eastern United States between 1808 and 1813. To fix with permanence his knowledge, he painted the wild life specimens he saw afield. Thus he attracted the attention

of men of science. He, himself, engraved in 1805 some of the plates from which his "American Ornithology" pages were struck. This completed work embraced 276 species of birds with descriptions of them, which he offered for sale at $120.00 per set.

He has left some very creditable poems. In brief, this gentleman, by one and all of these varied accomplishments, left a deep imprint upon the mind and heart of George Donaldson.

It seems that in September, 1865, George Donaldson, a Scotsman, polite and genteel, after extensive travels, wandered into the hills of Marion Township, Lawrence County, Indiana, where the unusual beauty of his surroundings captivated him. He approached James C. Lynn, a pioneer in those parts, asking to purchase of him 101 acres. Upon his acquiring the desired ground he named it "Beautiful Shawnee" as it

FIG. 5. Location of the Alexander Wilson monument in Indiana.

FIG. 6. Detail of carving on the face of the monument.

was reported to have been a camp of that Indian tribe. In the woodland he at once built a home and proceeded to add to his knowledge of the plant and animal life to be found upon his purchase. As he came to Indiana with a love for wild life, largely the result of the influence of Alexander Wilson, it is only natural that he should have, upon settling down there, promulgated edicts to his caretaker not to permit a snake to be killed, a butterfly to be caught, or a flower or twig to be broken within his domain. For such an attitude toward nature he became known as an eccentric. Today he would be called a conservationist. Here this kind soul resided, regularly walking to his Presbyterian Church, encouraging relatives from far distances to become his guests often for as long as a year at a time. Donaldson obtained all that was to be had from his pleasant life of leisure until 1871 when he left Indiana and settled in the State of Alabama.

There is not much doubt that his admiration for Alexander Wilson took concrete form in the erection of this monument in 1866, the cen-

tenary of the birth of the now celebrated naturalist, now generously and generally known as "The Father of American Ornithology". Wilson had been born in Paisley, Scotland, and died at forty-seven years of age in 1813, two years after Donaldson was born. Some forty years after the demise of Wilson, his influence on Donaldson was yet strong. He was still realizing that his joy in outdoor history of bird and beast was brought to fruition through Wilson's arguments expressed while afield: "From these barren and musty records, the author of the present work has a thousand times turned with a delight bordering on adoration, to the magnificent repository of the woods and fields—the *Grand Aviary of Nature.* In this divine school he has studied from no vulgar *copy;* but from the works of the GREAT MASTER OF CREATION himself; and has read with rapture the lessons of his

FIG. 7. The Alexander Wilson monument in Indiana, with fence enclosure.

wisdom, his goodness and his love, in the conformation, the habitudes, melody and migrations of this beautiful portion of the work of his hands. To communicate as correct ideas of these as his feeble powers were capable of, and thus, from objects, that, in our rural walks, almost everywhere present themselves, to deduce not only amusement and instruction, but the highest incitements to virtue and piety, have been the author's most anxious and ardent wish." . . .

". . . For to me it appears that, of all inferior creatures, Heaven seems to have intended birds as the most cheerful associates of man;

to soothe and exhilarate him in his labors by their varied melody, of which no other creature, but man, is capable; to prevent the increase of those supernumerary hosts of insects that would soon consume the products of his industry; to glean up the refuse of his fields, 'that nothing be lost,' . . ."

I can see Donaldson in my mind's eye, winding through the valley, delighting in its flowers and its bird life, enjoying its butterflies and beetles, and then all at once realizing that it was through Alexander Wilson that this appreciation of such phenomena had been engendered. What he would have missed, thought he, in culture, in understanding, in incentive to seek knowledge of the wild had this love of the outdoors not been his. Should he not in some way honor the memory of his mentor? Could he labor to attest his gratitude to Wilson, then gone to his reward? He would leave a monument in the place that brought him the greatest opportunity to learn of the things he had been inspired to ferret out. The ravine, where stands the shaft, was doubtless chosen thus.

Would that Donaldson had seen fit to remain for the remainder of his long life within the borders of our State. He did not, however. He came to feel that he would, some day, launch out again to learn of other lands, so he never even became a legal citizen of the United States. He had the spirit of a rover and after travels to other foreign lands returned to Ayrshire in his homeland for his last year of life. In September, 1898, he breathed his last and is honored by burial in the Old Necropolis at Glasgow, near where he was born.

Should not our State feel proud that a seventy-year-old monument to the self-taught, gifted Alexander Wilson (perhaps the earliest memorial to be erected in his honor in this whole country) continues to grace one of our most beautiful outdoor temples! It represents a most sincere tribute indeed to Wilson, for no blare of trumpets heralded its dedication, if any there was. It was not erected at a crossroads to conspicuously reflect more credit upon its maker than upon its subject. This was at the time a true, personal tribute. Donaldson's admiration brought him satisfaction through his visits to it where he could in quiet think upon the talents and character of Alexander Wilson, which had been such a stimulus to his own activities. We can not but feel that was the real purpose of the shaft, its conception and its execution.

Donaldson, as did John Lusk in saving the trees in what is now Turkey Run State Park, preserved in pristine wildness with its silva, flora, and fauna, an area out of which has been carved a park of rare beauty. Both these men deserve our unstinted praise.

Now, with the opportunity to visit this monument in the grand park at Spring Mill, we, the public, are pleased to have a share in attesting our admiration for both the nature-loving men, Donaldson and Wilson, whose names are linked with this unique tribute in stone.

INDIANAPOLIS, IND.

THE 1937 WATERFOWL SEASON IN THE PRINCE ALBERT DISTRICT, CENTRAL SASKATCHEWAN.

BY O. C. FURNISS

The 1937 waterfowl season in the Prince Albert district has been far less favorable than those of former seasons. A remarkable decline in the number of broods has taken place even though conditions earlier in the year indicated that a successful season could be expected. Water levels reached their lowest in the fifteen years of observations carried on by the writer and in the lifetime experience of the oldest settlers.

The information in this paper is based on observations carried on during the migration, breeding, and post-breeding seasons on eighty-three sloughs and potholes south of the city. It does not pretend to be exhaustive, but may serve to show the influence of certain factors and the general trend of conditions as they exist in this area.

LOCALITY

The Prince Albert district is on the dividing line between the typical Canadian and Transition Life Zones; and consists of rolling well-wooded country, the characteristic trees being aspens and willows, with numerous small sloughs and potholes. It is adapted to mixed farming and has been settled for the past fifty years. The area has a creek flowing through the middle of it which helped to maintain the level of some of the sloughs much longer than would otherwise have been the case. The locality may be considered as being very favorable for breeding waterfowl.

WATER LEVELS

The water levels in the sloughs in this area depend for the maintenance of their levels upon spring run-off. The amount of water received from rainfall in the summer season does not make up for that lost by evaporation, a poor spring run-off lowers the levels. There has been a tendency toward lower levels for several seasons in the sloughs studied in this paper, but no sudden lowering was noted until the summer of 1936. The first survey of broods was made in 1934 when the area was mapped and the work started; levels at that time

were considered normal. Since the summer of 1934 many sloughs have disappeared except for a short time in the early spring, due to the very dry and hot summers of 1936 and 1937 and poor run-off from spring thaws.

The amount of spring run-off will vary with the snowfall and the coming of warm weather. Early thaws during late February and early March will cause the upper crust of the snow to soften and increase in density. When the total layer of snow has "packed" or increased in density, there will be a run-off at lower temperatures. This spell of warm weather never lasts beyond a few days but the result is always a poor run-off unless there is an added snowfall. When early thaws occur and the snow has become "packed", the winds during March evaporate much of the moisture from the snow even though the temperature may be sufficiently low to prevent any actual run-off. This happened during the springs of 1936 and 1937 and the result has been a tremendous lowering of water levels in this and adjacent areas. If the levels of the eighty-three sloughs and potholes studied were considered to be about normal during 1934, then there has been a complete drying up of at least fifty per cent and, with many, such a change in growth that a stranger would never realize that such places two and three years ago contained sufficient water to encourage Canvas-backs to nest and successfully raise their young.

In 1934 the eighty-three sloughs and potholes in the area contained water throughout the year or until late summer; this year (1937) all had some water during the early spring. Fourteen of these may be classified as "rest" sloughs, that is, while they provided plenty of food and were above average for the district in size, the surrounding cover offered no inducement for the concealment of nests. Large numbers of ducks could be noted on them at all times resting or feeding. During July, 1934, none of these sloughs was over twelve acres, the area being estimated by the amount of open water. Graph 1 shows the normal area in 1934 and the number and size of the sloughs. The decrease in size and number took place so rapidly during July in 1936 and 1937 that it would be impossible to list them in any graph.

Nesting Cover

The cover around the sloughs was listed as "good", "fair", and "poor", from the viewpoint of providing effective concealment for nests. Those listed as "good" had a heavy stand of *Typha latifolia* or *Scirpus validus* in the water and a heavy land cover such as *Scolochloa festucacea*. Those listed as "fair" had either a good stand of cover in the water and none on the land or vice versa. Those listed as "poor"

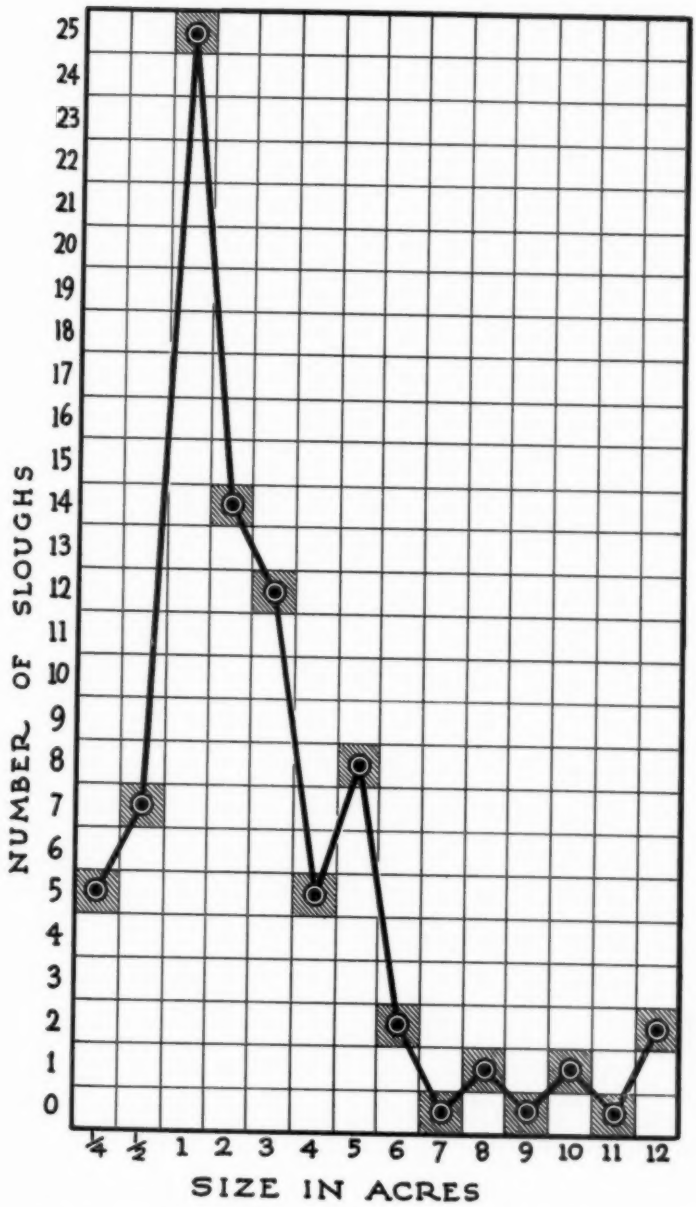

FIG. 8. Graph No. 1, showing the number and size of the bodies of water examined in 1934. Vertical scale indicates the number of sloughs; the horizontal scale, the size in acres.

were deficient in both types, or the growth was so slight that it could not be considered effective in nest concealment.

In many instances those sloughs listed as "fair" had had the land cover destroyed by:

1. Grazing by livestock.
2. Burning by farmers.
3. Mowing for hay the previous summer.

The first two factors are particularly destructive to nesting cover especially for those species of ducks that nest on the uplands. Grazing destroys every vestige of cover on the edges and during dry seasons stock also break down the heavier stands of *Typha* or *Scirpus* in the water. If there has been a dry spring, stock wade through these stands of cover and destroy nests of such species as the Canvas-back and Redhead. Fire destroys mainly the land cover, but if the growth in the water is heavily lodged it will destroy it also. Mowing the land cover does not have the same direct effect; the haying season does not take place until well into July when most species have completed nesting, and if the cover is inadequate next spring, the birds will have a tendency to nest elsewhere.

The sloughs in the area were classified as follows:

Cover Good		Cover Fair		Cover Poor	
No.	Per Cent	No.	Per Cent	No.	Per Cent
22	26.50	42	50.60	19	22.90

Typha latifolia and *Scirpus validus* are the most common cover plants found in the sloughs in this district. Other aquatic plants occur such as various species of *Carex* and in a few sloughs small stands of *Scirpus americanus* may be found. The most common cover on the land edges of the sloughs is *Scolochloa festucacea*, a few sloughs have *Hordeum jubatum* and *Agrostis hiemalis*. *Typha latifolia*, *Scirpus validus*, and *Scolochloa festucacea* are the three most common plants and provide the best growth for effective nest concealment.

During the last two summers these rings of vegetation have been drawing gradually toward the centers of the sloughs as the levels dropped. This fact has given to the casual observer a mistaken idea as to the actual trend of levels and conditions. The layman, in the spring, sees the run-off well up and past last season's growth of *Typha* and the impression is one of good water conditions. If a careful note is taken, it will be found that there are other seasons' growth higher up on the shore to which the run-off never reaches and has not done for several years.

Food Plants

Food plants were noted as being common and ample food was found in all the sloughs examined. *Potamogeton* was very abundant particularly in the rest sloughs. *P. pectinatus* was the most common species although *P. pusillus* and *P. richardsonii* were also present. *Sagittaria latifolia, Ranunculus aquatilis, Lemma minor, Eleocharis palustris,* and *Sparganium eurycarpum* were the most common foods after the *Potamogetons. Ruppia occidentalis* was found in one slough.

Observations on Waterfowl: Methods

The area under observation consisted of twenty quarter-sections; and in order to arrive at comparable data on sex ratio and specific abundance the territory was divided into twenty divisions of one quarter-section each. Each division was covered once a week. A map of the whole area was drawn and the sloughs and potholes listed and numbered. A time-table was followed so that each division received the same attention and was examined the same time each week. In each inspection all the ducks on every slough, in the quarter-section to be visited, were listed specifically, sexually, and according to numbers. Ducks noted on adjacent areas were not listed until the time came to study that area. Some of the surface feeders flew up and there was the possibility that they settled on the next slough to be covered. When in the opinion of the observer such was the case, due allowance was made. However, this did not frequently happen as they usually flew to another area. Also out of a total of eighty-three sloughs and potholes it was most unlikely that they would fly to the next particular slough to be visited.

The nests of any ducks that were found were carefully noted as to position, concealment, number of eggs, proximity of possible predators, and numbered. A history of each nest was kept in an effort to arrive at the percentage of hatch for the whole area. Late in July a brood count was taken for comparison with other years.

Spring Migration

The earliest ducks to arrive in the spring reach here about the third week in April, depending upon the amount of open water, and are usually Mallards, Pintails, and some of the mergansers which, however, pass on as open water appears farther north. By the first of May the bulk of the migrants has arrived with the exception of the Blue-winged Teals, Shovellers, and Ruddy Ducks which increase daily. The White-winged Scoter, the last arrival, does not arrive until about May 21 and does not remain to breed but passes on to larger bodies of water.

Breeding Season Population

During the seasons 1935 and 1936 the census to determine the relative and specific abundance, as well as the sex ratio, of the ducks in the area under observation was started on April 27 and followed through until May 17. During the present year (1937) the count was started on May 2 and followed through until May 23. At the termination of this period Mallards, Pintails, and Canvas-backs were nesting in numbers and if the count had been continued would have shown an overwhelming excess of males over females. The work was started a little later this year because during the first two seasons the relative standings of such late arriving species as the Blue-winged Teal and Shoveller could not be determined. Tables 1 and 2 show the results obtained for the season 1937 and the average for the two previous seasons of 1935 and 1936.

Table 1. The average breeding season populations for the two seasons 1935 and 1936 as estimated from counts taken from April 27 until May 17.

Species	Total	Males	Females	Ratio of males to females
Mallard	120.5	73	47.5	1.53—1
Gadwall	3.5	2	1.5	1.33—1
Widgeon	37.5	20	17.5	1.12—1
Green-winged Teal	26.5	14.5	12	1.20—1
Blue-winged Teal	58	33.5	24.5	1.37—1
Shoveller	15	8	7	1.14—1
Pintail	41.5	32	9.5	3.36—1
Redhead	37	20.5	16.5	1.24—1
Canvas-back	127	70	57	1.40—1
Lesser Scaup	437.5	266.5	171	1.41—1
Ring-necked Duck	20.5	10.5	10	1.05—1
American Golden-eye	23	12	11	1.09—1
Bufflehead	13	8.5	4.5	1.88—1
Ruddy Duck	41	28.5	12.5	2.88—1
	1001.5	599.5	402	1.46—1

Table 2. Breeding season population for the year 1937 as estimated from a count taken from May 2 until May 23.

Species	Total	Males	Females	Ratio	Standing
Mallard	118	73	45	1.62—1	Decrease 2%
Gadwall	4	2	2	1.00—1	Increase 14%
Widgeon	51	27	24	1.12—1	Increase 33%
Green-winged Teal	73	42	31	1.35—1	Increase 175%
Blue-winged Teal	145	78	67	1.16—1	Increase 150%
Shoveller	61	32	29	1.10—1	Increase 306%
Pintail	75	44	31	1.41—1	Increase 80%
Redhead	61	31	30	1.03—1	Increase 65%
Canvas-back	133	76	57	1.33—1	Increase 4%
Lesser Scaup	267	163	104	1.56—1	Decrease 40%
Ring-necked Duck	14	8	6	1.33—1	Decrease 33%
American Golden-eye	20	11	9	1.22—1	Decrease 13%
Bufflehead	27	17	10	1.70—1	Increase 106%
Ruddy Duck	56	39	17	2.29—1	Increase 34%
	1105	643	462	1.39—1	Increase 13%

The relatively large increases in some of the later arriving ducks must not be considered as an actual increase over former years because as stated during the present season (1937) the count was started several days later and continued several days longer in the spring. This delay enabled these species to appear in Table 2 in more approximately their real position. The striking feature is the decline in the numbers of Lesser Scaups. This decrease may have been due to a movement farther north than during previous years, but this is only a conjecture as the brood count taken later in the summer (see Tables 6 and 7) showed a corresponding decrease. If, then, the increase of thirteen per cent is closely analyzed, it will be found that there has been no actual increase and possibly a decline. The increase in later arriving species, which have been here every year, will not make up for the loss in Lesser Scaups. The count as a whole, however, shows most species standing up fairly well in this area, particularly the threatened Redheads and Canvas-backs. As mentioned before, this district is very favorable for breeding waterfowl but the surrounding country is poor and ducks are more scarce. If, then, the conditions were so much better here, and they may be considered so, a large increase or a concentration of birds could be expected. Such was not the case, the inference to be drawn is that the scarcity of ducks is greater than generally realized.

Other species of waterfowl were also present for a few days during transit, American and Red-breasted Mergansers, and White-winged Scoters. These birds do not breed in this district and consequently were not included. The Greater Scaup, also, has been noted on rare occasions.

The sex ratio does not agree with that as given by some authorities. These records were derived from fewer numbers but taken from potential breeding birds in their breeding territories.

Many of the Mallards and Pintails had mated before they arrived in the early spring and it was only a very few days before they had established nests. Other species appeared to spend considerable time in pairs before actually nesting. This was particularly noticeable with the Lesser Scaups and the Ruddy Ducks.

Nesting Data

During 1937 histories of sixty-seven nests were obtained and compared with the histories of forty-one nests for 1935.

TABLE 3. Summary of hatched and destroyed nests for seasons 1937 and 1935.

Species	Season 1937 Nests	Hatched	Destroyed	Season 1935 Nests	Hatched	Destroyed
Mallard	18	14	4	15	11	4
Green-winged Teal	....	....	....	1	0	1
Blue-winged Teal	9	5	4	1	0	1
Pintail	1	1	0	1	1	0
Shoveller	2	1	1	....	....	....
Redhead	3	2	1	2	1	1(lost)
Canvas-back	26	22	4	14	12	2
Lesser Scaup	3	3	0	1	1	0
Ring-necked Duck	1	0	1	....	....	....
American Golden-eye	....	....	....	1	1	0
Bufflehead	1	1	0	....	....	....
Ruddy Duck	3*	1	1	5	3	2
	67	50	16	41	30	11

Percentage of hatch: 1937 = 74.33%; 1935 = 73.17%.

*One nest of a Ruddy Duck eventually turned into a community affair.

The agencies of destruction and the percentage of each for the two years are listed in Table 4.

TABLE 4. Agencies of destruction and percentage of each on nests under observation.

Agent	Nests destroyed 1935	Per Cent 1935	Nests destroyed 1937	Per Cent 1937
Crow	3	7.50	6	9.09
Skunk	....	.....	5	7.59
Deserted	7	17.50	2	3.03
Fire	1	2.50	....	.....
Cattle	....	.....	1	1.53
Unknown causes	1	2.50	2	3.03

Fifteen per cent of the total nests were parasitized by other ducks. This was most noticeable with the Redheads and Canvas-backs. The large number of desertions during 1935 may have been partly due to parasitization. Two Mallard nests contained eggs of other ducks (Lesser Scaup and Mallard). Five Canvas-back nests contained either other Canvas-back or Redhead eggs. One contained seventeen eggs of which only eight hatched. Another Redhead's nest contained fifteen Redhead eggs of which nine hatched. Several platforms were found in the dense stands of *Typha* containing several Redhead eggs. One Ruddy Duck nest eventually turned into a community nest with eleven eggs.

The extent of Crow destruction was far less than was at first expected. This may be partly due to the fact that there are far fewer

Crows here than are to be found in a more open type of country to the south. As previously mentioned, the nests were noted as to concealment, judged of course from human standards. With the classification of either "well-concealed" or "open" there appeared to be no difference in the amount of destruction by Crows, one group being destroyed as readily as the other. One nest of a Mallard was built in such a dense mass of lodged growth that the female had difficulty in extricating herself when flushed. This nest was subsequently destroyed by Crows. In marsh growth the Crow seems to work best when the lodged *Typha* or *Scirpus* enables them to walk and climb about, while if the growth is new or standing there appears to be little or no destruction.

During 1935 and 1937 nine Marsh Hawks' nests were found and a close watch kept on the young after hatching to determine if any young ducklings were being fed to them. Several visits to each nest failed to reveal any evidence to indicate that such may have happened.

Around one slough were found three Mallard's nests, one Marsh Hawk's nest, and one Crow's nest, all within a radius of fifty yards. All nests of the Mallards, the Marsh Hawk, and the Crow were successfully hatched. Other instances of close nesting could be related and in each case the duck's nest was successfully terminated.

The season of 1937 witnessed a large increase in the number of skunks and the very low water levels of late June and early July enabled these predators to forage around and destroy nests of Redheads, Canvas-backs, and Ring-necked Ducks.

The average egg clutches, determined by completed sets, for the two years are listed under Table 5.

TABLE 5. Egg sets for seasons 1935 and 1937.

Species	No. nests	Largest set	Smallest set	Average set
Mallard	31	11	5	8.56
Blue-winged Teal	9	12	9	10.20
Shoveller	1	9	9	9.00
Pintail	2	8	7	7.50
Redhead	3	10	9	9.33
Canvas-back	38	10	5	7.38
Lesser Scaup	4	11	9	9.66
Ring-necked Duck	1	9	9	9.00
Bufflehead	1	5	5	5.00
Ruddy Duck	6	8	2	6.00

Although there were certain indications pointing to the fact that some of the earlier nesting ducks may have had a second attempt at nesting, nothing definite could be proved.

Brood Data

The brood census taken during the third week in July revealed a decrease of 48.86 per cent in the number of broods when compared with the average for the years 1934 and 1935. This remarkable decline could not be attributed to any known cause unless it was the result of the extreme heat and drought of early July, or the fact that there was a decrease in breeding stock previously mentioned.

Tables 6 and 7 show the information obtained from this census and a comparison with the average of previous years.

Table 6. Brood census information averaged for the years 1934 and 1935.

Species	Ave. No. broods	Ave. No. per brood	Smallest brood	Largest brood	Ave. total young	Percentage of total young
Mallard	7.50	5.80	2	8	42	5.70
Wigeon	6.00	6.21	2	9	36.5	4.99
Green-winged Teal	1.50	4.75	2	7	7.50	1.00
Blue-winged Teal	16.00	7.21	3	10	115	15.91
Shoveller	4.00	7.26	5	11	30	3.98
Pintail	5.50	7.31	3	9	28.5	5.69
Redhead	4.00	6.20	4	9	26	3.43
Canvas-back	15.50	5.44	1	8	84.50	12.16
Lesser Scaup	24.00	8.42	1	15	180	24.83
Ring-necked Duck	.50	5.00	5	5	5	.01
American Golden-eye	1.50	5.75	4	7	8	1.15
Bufflehead	1.50	4.51	3	6	7.50	1.08
Ruddy Duck	26.00	5.54	2	11	145.50	19.82
	110.50	6.50	1	15	718.50	99.75

Table 7. Brood census 1937 and comparison with number of broods for 1934-1935.

Species	No. broods	Ave. No. per brood	Smallest brood	Largest brood	Total young	Percentage total young	Brood standing with previous average
Mallard	7	5.85	3	7	41	11.42	Decrease 6.66%
Widgeon	4	5.20	2	8	21	5.84	Decrease 33.33%
Blue-winged Teal	19	4.89	1	9	93	25.90	Increase 18.75%
Shoveller	4	6.75	5	8	27	7.52	Same
Pintail	8	4.25	1	7	34	9.46	Increase 45.45%
Redhead	2	5.00	4	6	10	2.78	Decrease 50.00%
Canvas-back	11	6.27	2	9	69	19.22	Decrease 27.09%
Lesser Scaup	4	8.00	4	10	32	8.91	Decrease 83.33%
American Golden-eye	1	9.00	9	9	9	2.50	Decrease 33.33%
Bufflehead	1	6.00	6	6	6	1.67	Decrease 33.33%
Ruddy Duck	5	3.40	1	5	17	4.73	Decrease 80.77%
	66	5.45	1	10	359	99.95	Decrease 48.86%

The earlier nesting ducks had the smaller broods as could be expected, while the later nesting scaups and teals had the larger. An indication of the percentage of mortality during the first five weeks

after hatching may be obtained by comparing the average egg clutch of Mallards, which runs (based on thirty-one nests) 8.56 and the average hatching date, June 15, with the average brood taken during the third week in July, which was 5.78 (based on twenty-two broods over a three-year period). Such a comparison indicates a mortality of thirty-two per cent for the first five-week period immediately following hatching. The same method will indicate the mortality, over the same period, for Canvas-backs, based on thirty-eight nests and forty-two broods, and runs 20.5 per cent.

Summary

A general summary reveals that until the late summer of 1936 conditions on the whole were very satisfactory when compared with other points, even though there has been a gradual lowering of water levels during the last fifteen years. The last two summers, exceedingly hot and dry, have dried up breeding sloughs and potholes, and any advantage that this district had when compared with other surrounding areas has almost disappeared. The decrease in waterfowl due to such predators as Crows and Marsh Hawks seems, as far as this area is concerned, to be greatly exaggerated. The oft quoted statement that as conditions in southern Saskatchewan and the northern parts of the United States became unsuitable for waterfowl they migrated and nested farther north appears unproved. Even when conditions here were nearly normal and conditions elsewhere much worse, there was no new influx of birds. The total number of young birds decreased this year (1937) by fifty per cent and the broods by almost the same figure. The decrease in the numbers of Lesser Scaups in the spring census is reflected again in the decrease in broods. The severe drought throughout the southern portions of the Prairie Provinces will not be off-set by the halting conservation policies at present in force and continued open seasons.

Prince Albert, Saskatchewan.

THE NORTHERN BALD EAGLE IN BRITISH COLUMBIA

BY J. A. MUNRO

In the spring of 1935 during a six-weeks visit to Graham Island, the largest of the Queen Charlotte group, opportunities to watch the actions of the Northern Bald Eagle (*Haliaeetus leucocephalus alascanus*) occurred almost daily. A report of these observations together with others made elsewhere in British Columbia is presented in the following paper.

The first three localities mentioned are on Graham Island; Departure Bay is on Vancouver Island, and the other localities referred to are in the interior of British Columbia.

At Tl-ell the local population of Bald Eagles was estimated to be twenty individuals comprising five adults and fifteen others of various ages. These frequented the Tl-ell River, which for some miles parallels the sea; the sea beach and, somewhat less commonly, an open wooded area between. None were seen in the muskegs nor in the heavy timber which covers the greater part of the district. It was reported to me that during the autumn Bald Eagles become much more abundant and feed largely on salmon which are then ascending the river on their spawning migration.

At this time, i. e., in the spring, it was indicated that most of their food is taken from the sea beach and from the boulder reefs exposed at low tide. Day after day during full tide periods Bald Eagles could be seen standing in one or another of the spruces on the outer, seaward edge of the spruce forest—once five birds occupied the same tree—on the logs which covered much of the upper beach or on the sand near the water's edge and there they waited motionless until the falling tide uncovered a large expanse of boulder reef. During half tide or low tide these same birds invariably occupied the reef, some standing on the higher boulders, others on the patches of sand between. Very often several birds hunted the extreme outer edge of the boulder area where they could be seen standing in water deep enough to wet their tibial plumes.

Dogfish drifted ashore in considerable numbers; at one time I counted thirteen on about a mile of beach and each of these had been partially eaten by eagles as could be told, in some instances, by the tracks around them. Several times eagles were seen feeding on dogfish and as they tore at the carcass one or more Glaucous-winged Gulls stood motionless a few feet away awaiting their turn at the carcass. On one occasion an eagle so engaged was attended by two Glaucous-winged Gulls and a raven.

A young Bald Eagle carrying a dogfish head in his claws was seen flying from the beach to the spruce trees where he alighted. Later on a large number of dogfish heads and tails were found under these trees where they had been dropped by eagles. Here also were found the feathers of a Pintail, the sternum of an unidentified duck, and the bones of a rabbit, all of which had been exposed to the weather for some months. The item occurring most frequently was crab, broken chelae and carapaceae being found under nearly all the trees along the beach.

One morning it was noticed that since the previous evening a doe deer had washed up on the beach and been nearly all consumed. Standing here and there around the carcass on drift logs and on the sand were eight eagles and three ravens—their immobility indicating repletion—while two Glaucous-winged Gulls pulled at the shreds of meat still adhering to the bones.

When flying along the river eagles sometimes put a flock of American Golden-eyes to flight but I saw no attempt to molest them. It was noted with surprise that Mallards on a small lake near the sea paid no attention to the eagles which sometimes flew over them not more than forty yards above the water, but these same ducks would take flight if I approached closer than 150 yards. Neither did the Trumpeter Swan which frequented this same lake pay any attention to the eagles' presence.

Eagles used the low trees surrounding this lake as resting places and were seen there daily. It was assumed they were attracted to these open woods by the introduced rabbits and Mongolian Pheasants of which there was an abundance. But a diligent search revealed no "kills", and, although I passed through these woods at least once a day for three weeks and each time saw eagles, at no time did I see them actually hunting. This seemed the more remarkable in view of the fact that rabbits nearly always were in view hopping across the open mossy glades. Pheasants were more plentiful in this limited area than in any other district of comparable size in British Columbia according to my observations. It seems doubtful that this species could have increased to such an extent, from the small stock introduced about fifteen years ago, if eagles had preyed upon them consistently. No Sitka Grouse were in these open woods and according to the residents there never had been. This species frequents the semi-open muskegs and the timber adjacent to these areas. I have never seen them in woods of the kind described above either at Tl-ell or at other places on Graham Island.

A flock of sheep accompanied by a number of young lambs pastured these woods and frequently in their wanderings loitered and sometimes lay down within a few yards of trees in which eagles were perched. The eagles paid no attention to the lambs. For the past five years two settlers have run flocks of sheep in this area without suffering any losses through eagles.

During a stay of two weeks on the Sangan River I saw only two Bald Eagles, an adult and an immature bird. Both were seen daily, sometimes flying up the open lane which marked the course of the Sangan through the forest, or else on Chown Slough or on the sea beach at the river's mouth. The sea bottom here is entirely sand and gravel so that small sea animals are not abundant as is the case where low tides expose rocks and boulders. Consequently little food other than carrion and, in the fall, salmon is available for eagles.

Dr. Dunn, a resident on the Sangan River, informed me that usually three broods of American Mergansers are hatched on the river and that Bald Eagles reduce the number of young to three or four in a brood during the course of the summer.

An experience on this river suggests that mergansers recognize the Bald Eagle as an enemy. I was concealed in a dense thicket of salal on the edge of a steep cut bank along the river and looking down upon nine yearling American Mergansers that were in possession of a gravel bar almost directly below me and not more than fifty feet away. The ducks stood or lay in various positions of relaxation some with necks turned and bill buried in the feathers of the back. They were close enough so that I could see sexual differences in bill coloration and individual variation in the tint of their under parts. On either side of the narrow river giant spruces towered and in looking upward, as if from the bottom of a canyon, one saw only a narrow strip of blue sky. The water slipped past the edge of the gravel bar with a murmurous hum, otherwise the silence was complete. Suddenly a Bald Eagle—a shadow passing across the strip of blue sky—whistled and simultaneously, or so it seemed, each merganser became tense, alert and ready for instant flight. Some continued to stand where they were, others slipped into the water to revolve slowly with the current. The eagle cry was not repeated, neither did the bird reappear across the strip of blue, and in a few minutes all the mergansers again were relaxed on the gravel bar.

At the head of Massett Inlet about one hundred feet from the edge of the shore line forest between McClinton Creek and Bald Eagle Creek is a large Bald Eagle's nest fifty feet from the top of a heavily

FIG. 9. A Boulder Reef, at low tide, on Graham Island, B. C. A feeding ground for the Northern Bald Eagle.

FIG. 10. A Mud Flat, at low tide, in McClenton Bay, B. C., showing "dolphins".

foliaged, forked Sitka spruce, estimated to be 150 feet in height. During the last two weeks of April the female evidently was incubating eggs but could not be seen on the nest because of the intervening foliage which concealed its top. The male usually occupied a tall spruce near the end of a point which commanded a view up and down McClinton Bay. The two birds were seen together only once when they stood in a dead spruce one hundred yards or so farther back in the forest from the nesting tree. These eagles, observed almost daily for two weeks, were not seen hunting waterfowl. Mr. J. Stannard, of the Pacific Biological Field Station, at McClinton Creek, told me that the nest had been occupied for three years at least. Mr. Stannard also stated that he had seen Bald Eagles capturing young American Mergansers eventually taking all but one of a brood. This was in midsummer when the female merganser during high daylight tides led her brood from McClinton Creek out on the bay over the submerged tide flats, a habit of this duck when nesting near the mouth of a tidal stream.

At McClinton Creek the tide flat is the Bald Eagles' chief hunting ground and their lookouts are one or another of the six "dolphins" which are conspicuous objects on the bay and directly in front of the nest. These are tall piles driven into the flats for the purpose of mooring log booms but long in disuse with grass growing on their tops and barnacle-encrusted for a quarter of their height. From these perches, so Mr. Stannard stated, the eagles harry the young flightless mergansers.

The few Bald Eagles which frequent Departure Bay and vicinity during the winter months constantly are in sight of great flocks of gulls which have been attracted by the spawning of herring. For the most part the eagles completely ignore the presence of the gulls as do the gulls that of the eagles. This usually is so even at the time when gulls are feeding upon stranded herring spawn a short distance from a perching eagle.

But one incident contrary to this general behavior came under observation. In this case an adult Bald Eagle circled over a flock comprising one thousand or more gulls, which had congregated on a gravel bar at the water's edge, and put them to flight. Like a snowstorm of wings they milled about conspicuous against a dark background of forest while the eagle charged again and again into the thick of the flock. Possibly it was not intent on securing a meal and these actions were in the nature of play for later the eagle came flying, empty-clawed, along the shore.

FIG. 11. A resting place for Northern Bald Eagles, Tl-ell, B. C., with a Trumpeter Swan in flight.

FIG. 12. Nest and one young of the Northern Bald Eagle, Horse Lake, B. C.

No instances of Bald Eagles attacking diving ducks were noted at Departure Bay, but farther north at various places on Vancouver Island this habit came under observation. The method of hunting is to follow closely the under-water progress of a duck which seeks to scape the eagle by diving. Each time the duck emerges the eagle swoops down to the water so that dive follows dive in quick succession until finally the prey becomes exhausted and is captured. Some, but not all, of the ducks taken in this manner are incapable of flight as the result of gunshot wounds or other injuries. No instances of a Bald Eagle capturing an uninjured surface-feeding duck has come to my attention.

On the large lakes in southern British Columbia which remain open all winter it is common to see Bald Eagles harassing the Coots which winter there. When attacked the Coots come together in a close flock and move rapidly across the water with necks outstretched; they do not dive. The pursuing eagle planes downward but checks its flight when a few feet above the mass of birds, ascends, circles over the flock, then again hurls downward with tremendous force that again is suddenly braked. This maneuver may be repeated a dozen times without a capture being made and each time, terrified by the eagle's nearness, the Coots surge across the water. Apparently the eagle rarely takes a bird from the midst of the flock, although it would seem an easy thing to do, but pursues directly any straggler, and almost invariably captures it. On the other hand I have seen an eagle swoop down toward a compact flock twenty times or more and finally fly away without having captured a bird.

An example of different behavior was observed at Elk Lake, near Victoria, B. C., on January 8, 1926. One end of this small lake, which is a game reserve, was free of ice and crowded with Coots, Mallards, Baldpates, and a number of Red-breasted Mergansers. While I was watching this throng of birds several flocks of ducks on the outer edge of the gathering rose suddenly and circled toward me, Mallards quacking and Baldpates whistling. Immediately afterward an adult Bald Eagle appeared, passed swiftly over the flying ducks, swung up wind and dropped into the midst of a flock of Coots. All dived except one, which perhaps was a sick bird; this one the eagle lifted from the water and carried to a fir tree on the shore. He had hardly reached his destination before most of the ducks were again on the water.

Western Grebes also are taken as has been determined by the finding of their remains under trees in which eagles perch. The

Western Grebe is normally a vigorous and tireless diver, but each fall a number become weakened and emaciated and finally die from some complaint that apparently has not been diagnosed. It seems probable that it is these individuals which are taken by eagles.

At Horse Lake two pairs of Bald Eagles have eyries less than a mile apart near the east end of the lake. Until recently my knowledge of these birds was limited to occasional glimpses of them in flight and, on one occasion, the sight of two adults tearing at the carcass of a large fish which had drifted into the shallows.

Mr. Sigurd Larum, resident at Horse Lake since 1911, and a close observer of animal life, showed me the location of these nests and mentioned that one had been occupied each year from at least 1911 until 1931 when the tree holding it was blown down in a storm. The following year another nest was built about one hundred yards distant. In both cases the site was an old Douglas fir growing in thick woods on a mountain slope about one-quarter mile from the lake shore.

The second eyrie also was in a Douglas fir amongst more open wood and in clear view from the lake 200 yards below. Mr. Larum had first noticed this nest about 1931.

In August, 1936, I visited both nests in order to hunt for food remains in their vicinity. At this time one bird of the year hunted in the general neighborhood but the four adults, and whatever other young they raised, had moved elsewhere.

No remains of food were found near the first nest, i. e., the one farthest back from the lake. On the ground below the other nesting tree and under two Douglas firs close by were the following items: (1) headless and partly decomposed body of a half-grown Goldeneye, probably *Clangula islandica;* (2) skeleton of a Ruffed Grouse; (3) bones of one or more suckers; (4) tails and bones of two or more Kamloops trout.

This nest was photographed and while focusing the camera I remarked to my companion that it was unfortunate none of the eagles were at home. A moment later we heard an unmistakable whistle, a harsh rustle of wings, then a young Bald Eagle alighted on a bare branch directly over the nest!

The foregoing illustrates how local conditions and time of year modify the food habits of the Bald Eagle. At Tl-ell in the spring it is about as predatory as a Turkey Vulture; elsewhere it may prey upon diving ducks, coots, grebes, grouse, fishes, or carrion depending on the availability of the various foods.

Okanagan Landing, B. C.

BACHMAN'S WARBLER IN ALABAMA

BY HENRY M. STEVENSON, JR.

Alabama seems already to have been peculiarly blessed with records of Bachman's Warbler (*Vermivora bachmani*), both in the number of sight records and in being one of the few states in which the nest has been found. Yet the bird is sufficiently rare to warrant the publication of additional records, and it is with this paucity of records in mind that I present the known records of the bird in this state since the publication of Howell's book,[1] giving first, however, the records of the bird given in that manual, for the benefit of those who themselves have not had the opportunity of reading the book.

The first record for the State is that of a male taken by A. A. Saunders at Woodbine, March 20, 1908.[2] Howell, himself, discovered the second bird, another male, taken in a small swamp near Autaugaville, April 16, 1912.[3] Howell and Peters collected males at Sipsey Fork, near Mellville, May 2 and 3, 1914; in Bear Swamp, May 10, of that year; and on the Tensaw River, below Mount Vernon, on May 27.

While their unusual habitat suggests that some of these birds were belated migrants, others were almost certainly breeding.

L. S. Golsan reported the following records: an immature bird seen near Autaugaville, August 26, 1912; a female seen near Prattville, May 21, 1916, seemed to be nesting; a male heard singing at Longview, April 7, 1917. In Bear Swamp, near Autaugaville, May 25, 1919, Mr. Golsan and Ernest G. Holt discovered a nest containing four fresh eggs, this being the first nesting record for the State.[4] These eggs are now in the collection of Mr. Golsan, who adds that the males of this species were usually abundant in Bear Swamp from March 20 to May 1. He states that this condition prevailed till 1928 when, possibly due to the cutting away of some of the timber, the birds disappeared, or else their presence was not cleared by as diligent or thorough search then as it was when Howell, Peters, and Holt were visiting the swamp.

My first experience with Bachman's Warbler takes me back to Irondale (near Birmingham), Alabama, and the warm, bright afternoon of April 9, 1936, when, strolling through the woods, I suddenly became conscious that I had been listening to the song of some bird strange to me. The song must have been sung within ear-shot half-a-dozen times before it really commanded my attention. Even then I

[1]Howell, Arthur H., Birds of Alabama, pp. 286, 287. 1928 (second edition).
[2]Saunders, A. A., Auk, Vol. 25, p. 481. 1908 .
[3]Golsan, Lewis S. and Ernest G. Holt, Auk, Vol. 31, p. 231. 1914.
[4]Holt, E. G., Auk, Vol. 37, pp. 103, 104. 1920.

probably should have attributed it to a Chipping Sparrow, had it not come from the depths of a thick, damp woodland. Long before I had covered the fifty or sixty yards separating me from the tree in which the songster was performing, I felt reasonably sure of the bird's identity, as such phrases from the familiar manuals I have read as "short, buzzing trill", "without change of pitch", and "quality of the Parula" came ringing back to my mind during each interlude. Though it seemed much longer, it was really only a few minutes before I had located the singer, an adult male Bachman's Warbler, high in a sweet gum tree (*Liquidambar styraciflua*). This was the red letter day of the whole spring for me. Four days later Mr. H. E. Wheeler and I re-visited the spot and found the bird in a red maple (*Acer rubrum*), not fifty yards from the previously mentioned sweet gum. This time he sang from the lower limbs. Subsequent visits to the spot failed to reveal any trace of the bird, so I concluded that he had moved on with the other spring migrants, possibly to the Sunken Lands of southeastern Missouri.

That the bird would summer in the area where he was found, however, was hardly to be expected, as it was only a seasonal swamp, if indeed it might be classed as a swamp at all, even in winter and spring. Not many yards from his immediate territory flowed Shades Creek, varying in width from eight to fifteen feet at this stage of its course.

Birds found not far distant from the Bachman's are: *Dryobates p. pubescens*, *Cyanocitta cristata florincola*, *Baeolophus bicolor*, *Hylocichla mustelina*, *Vireo g. griseus*, *Vireo olivaceus*, *Vermivora pinus*, *Dendroica v. virens* (migrant), *Wilsonia citrina*, *Setophaga ruticilla*, *Richmondena c. cardinalis*, *Spinus t. tristis*, *Pipilo erythrophthalmus* (subsp.?), and *Zonotrichia albicollis*—all more or less typical of the sort of territory in which *Vermivora bachmani* was found. Later field trips resulted in the discovery of the following additional species typical of the region, some of which are migrants: *Centurus carolinus*, *Empidonax virescens*, *Dumatella carolinensis*, *Vireo flavifrons*, *Protonotaria citrea*, *Helmitheros vermivorus*, *Vermivora peregrina*, *Compsothlypis a. americana*, *Dendroica caerulea*, *Dendroica fusca*, *Oporornis formosus*, *Agelaius p. phoeniceus*, and *Piranga r. rubra*.

At this place, as well as at Irondale, the bird's song was studied carefully and found to recur at intervals of from twelve to twenty-two seconds—more often fifteen seconds. It most nearly resembled in composition the trill song of the Chipping Sparrow (*Spizella passerina*), but seemed to be even drier, weaker, shorter, and less musical, the

quality being nearer that of the Parula Warbler (*Compsothlypis americana*). Indeed, anyone but an ornithologist might take the song to be that of an insect, especially if it were heard at a distance. Yet the song so closely resembles that of the Chipping Sparrow that if the two birds chose the same habitat positive identification of either by its song would be next to impossible. There is also a slighter resemblance to the songs of Worm-eating, Orange-crowned, Pine, and Tennessee Warblers, and to the "exhale" part of the Blue-wing's song. And were it not for the upward inflection in one of the trills of the Parula, here would be a quite accurate replica of the Bachman's song. But in the last analysis it may be stated that the song, well heard, should not be confused with that of any other swamp-loving species of bird, except possibly the richer, more musical song of the Worm-eater.

Retracing a bit, the second Bachman's Warbler the writer has ever seen was discovered in a swamp near Tuscaloosa—oddly enough, exactly a year from the date of the first record, April 9, 1936. It is the only time I have ever been fortunate enough to locate this species without first hearing its notes. During the few minutes that I had this individual under observation he sang half-heartedly from the top of a sweet gum only once or twice, and I have since suspected that nest-building activities were going on at the time. However, the cool and cloudy weather conditions may have discouraged his singing.

As this territory looked like a favorable breeding ground, Wheeler and I returned to it on May 1, 1937, another cool and cloudy day, with rain in the afternoon. Hardly had we reached the spot when we discovered the male, with food in his bill, on the lower limbs of a sweet gum. Eagerly we watched as the bird, after a few minutes of nervous hesitation, dropped to the edge of a thicket not twenty yards distant, remained a few seconds, then re-appeared and flew off. We lost no time in getting to the spot to search the bushes, but found no nest. Thinking that the bird might have dropped to a spot some distance from the nest, we thoroughly searched the thicket, but still found no nest save that of a White-eyed Vireo in a small holly. This nest contained four fresh eggs. The tour of the thicket completed, I was again at the starting point when the male once more flew down to the first spot visited. This time I marked the spot well and found the nest quickly. The difficulty in finding it before lay not so much in the seclusiveness of the hiding place as it did in the inconspicuous nature of the nest, and in the fact that it contained three young less than a week old rather than shiny white eggs. This fact would probably indicate that the birds had already commenced nesting activities when

the male was first discovered on April 9, about 100 yards from the spot.

The nest was a bulky and loosely constructed affair, owing its protection largely to the fact that, as already indicated, it might be mistaken for a cluster of half-decayed leaves accidentally lodged in the bushes about a foot from the ground. Besides half-decayed leaves of undetermined species, the nest consisted of the leaves of *Magnolia glauca*, some skeletonized, and various grasses, neither amounting to a very considerable part of the nest. Besides these materials, it was lined with some kind of black rootlet, mentioned also by Arthur T. Wayne as being present in all the nests he found. Wayne states that this "peculiar black fiber . . . may be the dead threads of the Spanish moss (*Dendropogon usneoides*) or a black rootlet".[5] In the case of the present nest, however, it could not well be Spanish "moss", as that plant probably does not grow within seventy-five miles of the spot.

The general location of this nest was in a thicket between two branches of an unused logging road, the trail dividing near the nest to re-unite farther on, leaving in between an isolated thicket about thirty yards long and seven or eight yards wide at its greatest width.

The nest was supported by one or two stems each of *Arundinaria tecta*, *Rubus floridus* (?), and *Vitis rotundifolia*, while high overhead hung the limbs of a fairly large elm, probably *Ulmus alata*, and scarcely ten feet away grew a medium-sized specimen of *Prunus serotina*, possibly the only one of its kind in the swamp. It was in this latter tree that the birds almost invariably alighted when coming to feed the young. The nest was also about fifteen feet from the nest of a White-eyed Vireo (*Vireo griseus*) mentioned above. Farther down the trail, incidentally, a nest of the Yellow-throated Vireo (*Vireo flavifrons*) containing three slightly incubated eggs was found in another holly in almost exactly the same sort of location as the first vireo's nest. It is interesting to note also that the warbler began nesting considerably earlier than these two vireos, comparatively early nesters themselves.

Descriptions and pictures of this warbler are numerous, but we may call attention to a few interesting features in that respect. The description calls for a light yellowish shoulder patch in both sexes, though it may be left off in some paintings, e. g. Howell's "Florida Bird Life", facing page 418. This feature was clearly observed in both sexes and the black noted on the breast of the male, which marking seemed not to extend so far down as is usually portrayed. Another error in some paintings of the bird was noticed in the color of the

[5]Wayne, Arthur T., Birds of South Carolina, p. 156. 1910.

female's breast. Instead of being a decided yellow, it was scarcely more so than the breast of Swainson's Warbler (*Limnothlypis swainsoni*), which is not very yellow. There was no opportunity to observe the rump patch in the female, but, as previously indicated, the shoulder patch was obvious. The young were hardly old enough to distinguish from the young of most other warblers.

During the domestic activities I was surprised to find that the female was much shyer than her mate. In fact she allowed us but one good look, and that from a distance of about thirty feet. In the case of most birds I am convinced that the female is the tamer on the nesting grounds. In this case the male was so confiding on one occasion as to feed the young while the observers looked on not more than fifteen feet away.

When the birds approached the nest bearing food they uttered a sharp, rapid, chipping note, very like that of the Chipping Sparrow, but somewhat weaker. The song was not noted on this occasion, as the parents were too busily occupied in supplying the young with food. They seemed always to be of a nervous, active temperament (like all Bachman's of my experience), not slow and easy-going (like the Blue-winged Warbler) as they have sometimes been described. There has been some controversy as to whether the birds range high or low in the trees—away from the nest, of course. In nearly every case the ones I have found inhabited the upper branches, but occasionally picked a tree that was not very tall. This applies particularly to the singing individual observed in Bear Swamp and discussed above.

The nesting records of this species in Alabama may serve to throw some light on a problem in Wayne's mind when he wrote, "Although I practically lived in the swamp from April to June 19, in order to determine whether the birds raise two broods, I am convinced that only one brood is raised, for this species is a very early migrant after the breeding season . . ." (recorded by J. W. Atkins, Key West, July 17).[6] I am inclined to disagree with Wayne on his supposition, and I believe that a study of some nesting dates will support my contention that the birds raise two broods a year, though the question will never be settled until someone has observed the same pair for a whole season, and that seems never to have been done. First let us consider Wayne's own nesting records, only the extreme dates on the occupied nests being mentioned. After twenty-five years of searching, Wayne finally discovered two nests of this bird in a swamp near Mount Pleasant, South Carolina, April 17, 1906, and the following spring he found

[6]Op. cit., pp. 155, 156.

a nest with four fresh eggs on March 30, and one with five incubated eggs on April 3. In both these latter examples, then, the nests contained full complements of eggs by the last of March. In Alabama the recent nest at Tuscaloosa must have contained the full complement by April 12, and the young must have left the nest by the middle of May, in good time for a second set to have been laid by the end of that month. This leads me to observe that the nest found in Bear Swamp, at least sixty miles farther south than Tuscaloosa and comparable in climate to Mount Pleasant, S. C., contained four fresh eggs on the date of the discovery, May 25, 1919. However, if the birds do raise two broods a year, are both nests constructed in the same general locality? The bird is known to be irregular in its movements, appearing at one place one year and elsewhere the next, but is it possible that a second brood may be raised by a pair of birds many miles from the site of the first locality of that year? These questions can be settled only by future observations. I spent hours searching for the Tuscaloosa birds on May 29, and days in search of more of the birds in Bear Swamp in early June, without finding another trace of any of them. The cutting out of timber may have been responsible for the Tuscaloosa nesters' evacuating their territory, as one large tree lay only a few feet from the nest itself, and the surrounding territory was scarcely recognizable as the same place where the birds had nested.

Summarizing, Bachman's Warbler is still rare—and its nest much rarer. Dr. Otto Widmann, discoverer of the first nest, found one other in southeastern Missouri, and Arthur T. Wayne found eight nests in South Carolina, three of which had been deserted. Logan found a nest in western Kentucky, and the list is completed with the addition of the two Alabama records. Probably less than a dozen tenanted nests have been found, and there is yet much to be learned about the birds' nesting habits. If this article can in any way stimulate further research and promote our knowledge of this second rarest of the North American warblers, the writer will feel repaid.

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SOME OBSERVATIONS ON FALL AND WINTER FOOD PATCHES FOR BIRDS IN SOUTHERN MICHIGAN

BY DURWARD L. ALLEN

For a number of years the Michigan Department of Conservation has taken an active interest in the testing of various grain-producing plants that might be useful in plantings to produce winter food for wildlife in Michigan. The data here presented result from two winters' study [1] of experimental plantings at the W. K. Kellogg Farm and Bird Sanctuary and the W. K. Kellogg Reforestation Tract near Battle Creek. Both areas are owned and operated by Michigan State College. This report deals only with the mechanics of winter food production. The need for winter food patches in southern Michigan will not be discussed.

Characteristics of a Good Food Plant

To best subserve the purpose for which it is intended a food patch plant must provide *an adequate and readily available supply of acceptable grain at the time when other foods are most scarce.* This means that fall flocks of migrant grackles or sparrows will not have eaten it. It means that the fruits must be persistent (that is, that the grain will remain on the stem). It means also that despite deep snow, high winds, or other weather conditions, the grain will be where birds can reach it. Of course it is essential that the food must be acceptable to the species for which it is intended.

Land that is available for wildlife plantings is usually that which is undesirable for agriculture. The best plant would be one that would grow in any type of soil under conditions of extreme dryness or wetness and produce a crop regardless of a good or poor growing season.

A Seed Mixture Recently Recommended for Wildlife

On the Williamston Coöperative Game Management Project[2] a mixture of crop seeds was developed for the purpose of providing winter food for wildlife (English, 1935). This mixture was recommended for several years by the Department and was quite widely used in Michigan and elsewhere. Following is a list of the seeds used in the mixture and the amounts of each per hundred pounds:

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[1] In connection with graduate studies in vertebrate ecology.

[2] An Ingham County project (1931-1933) sponsored by the University of Michigan Department of Forestry and Conservation, the Michigan Department of Conservation, and other agencies.

Sudan grass	14.0 lbs.
Buckwheat	12.6 lbs.
Cowpeas, New Era	8.4 lbs.
Flax	8.4 lbs.
Hemp	8.4 lbs.
Corn, Golden Glow	7.7 lbs.
Millet, White Wonder	4.5 lbs.
Millet, Common	4.5 lbs.
Millet, Tennessee German	4.5 lbs.
Proso, Hog Millet	4.2 lbs.
Kaffir Corn (Milo Maize) or Sorghum, Early Amber	4.2 lbs.
Hegeri	4.2 lbs.
Soy Bean, Manchu	4.2 lbs.
Soy Bean, Ito San	4.2 lbs.
Feterite	3.2 lbs.
Sunflower, Mammoth Russian	2.8 lbs.

It was recommended that the mixture be scattered broadcast (about twenty pounds to the acre) and harrowed in. The seed bed was to be prepared as for corn.

It was desirable to learn whether the value of this type of food patch as originally indicated at Williamston would be borne out by further experimentation on other areas. Accordingly, as a part of a Department of Conservation wildlife research project, nine plots varying in size were planted on the Kellogg Farm in June, 1935. Two of these were on dry, sandy, upland areas considered undesirable for cultivated crops; six were on low ground of a moisture content varying with the different localities; one occupied a three-acre field of good agricultural land. The soil of the area is a sandy loam. The farm is a sanctuary but is considered to be submarginal from the standpoint of game birds. As the 1935 growing season was an excellent one it was a very good opportunity for this mixture to show what it would do under favorable climatic conditions on the best and poorest soils and situations of this area.

In the fall it was apparent that the amounts of grain produced by the various plots varied in a marked degree. Those in dry soil contained small quantities of buckwheat and millet. This soon disappeared, and as winter food patches they were of little consequence. In the other seven patches the plants grew well and each of them had a good crop of some of the grains. On low moist ground the hemp flourished, and on dryer soil buckwheat had the advantage. On the whole, the amounts of grain in the patches at this season were satisfactory.

Songbirds were very appreciative of the food patches. Flocks of migrant grackles visited them in September. Later the bulk of the

grain was taken by Tree Sparrows and juncos. At various times goldfinches, redpolls, chickadees, and siskins were found using the food.

By January hemp was all that remained in quantity. What millet and buckwheat was left in some patches was gone by the end of that month or was covered by snow. In February the snow reached a depth of twenty-six inches and almost nothing could be gleaned from the ground. In some of the patches hemp projected above the snow and in one instance was used by quail for several weeks.

Although pheasants were flushed from the patches at times during the fall, the food did not appear to have much attraction for them. This was due, doubtless, to the very large quantities of natural foods that had resulted from the bounteous season. There were very few records of the presence of pheasants in the food patches during the winter after snow came.

The results of similar experiments in 1936 were much the same. The very dry season, however, prevented more of the plots from producing in quantity. Plots on low, moist ground showed a good growth, but those on dry soils were very nearly a total loss. There was little snow during the following winter season and what grain remained, after the inroads of fall migrants, was available through April. However, as both quail and pheasants were, through movements, nearly absent from the 500-acre area, this winter provided a poor test of use by these species.

In summary:

1. The plants in the mixture grew well in *good* soils but not in poor ones.

2. On good and intermediate soils in a favorable growing season a good crop of grain was produced. In a dry season the crop was much reduced on all but very low situations.

3. The grain produced was used by songbirds in the fall, which greatly reduced the potential winter supply. Pheasants used the patches at times during fall and early winter but were not conspicuously attracted by them.

4. When snow was deep and other foods most scarce, the only food patch plant that was available was hemp, and only the well-watered plots on good soil offered this.

These experiments indicated that under favorable growing conditions the food patch mixture would produce a good variety and quantity of foods for granivorous birds in fall and early winter. However it is not well adapted to poor soils and dry situations, and evidently is not a dependable source of food for pheasants and quail in late winter emergencies.

Standing Corn

Corn is the one grain which needs little if any further trial. It is well known that unharvested corn will remain available throughout the winter. Both pheasants and quail will use it regularly and it provides more or less cover for the feeding birds. Songbirds will not exhaust the supply in the fall and yet a cornfield is an excellent place for them to feed. The ragweed (*Ambrosia elatior*), foxtail (*Setaria lutescens* and *S. viridis*), lamb's quarters (*Chenopodium album*), redroot (*Amaranthus retroflexus*), and other ruderals that grow among the corn furnish very good food for all ground-feeding birds as long as the supply lasts and snow is not deep.

On the Kellogg Reforestration Tract of Michigan State College a two-acre field was prepared in the spring of 1936 and planted to corn. In this very dry season the crop gave little promise of coming to maturity. August rains revived the plants, however, and although the average height of the corn was not over three feet, a surprisingly good crop resulted. The plot was not cultivated and gave rise to growths of foxtail and ragweed which added to the food supply. These two acres of corn and weeds, even though growing on very dry and rocky soil, constituted a good food patch. The yield would be considered very poor from the agricultural viewpoint, but was quite sufficient for the birds. We have little fear of error in unreservedly recommending corn as *the* plant patch plant, if and where winter food patches are wanted for quail and pheasants in southern Michigan.

Weed Patches

Any investigator into the food habits of winter birds is at once impressed with the high percentage of the fall and winter food of some species furnished by our most common garden weeds (Judd, 1898). Some of the most important have already been cited. The tremendous dependence that is placed upon the ragweed by songbirds, pheasants, and quail is probably not generally appreciated. Horned larks, quail, pheasants, and large flocks of Tree Sparrows, Song Sparrows, and juncos fed avidly upon ragweed at the Kellogg Farm in the winter of 1935-36. The disappearance of the flocks of songbirds from the area in February was correlated directly with the almost total exhaustion of the supply of what ragweed still protruded above snow level.

Ragweed, lamb's quarters, and tumbling pigweed (*Amaranthus graecizans*) are among the first plants to appear on newly broken soils in this locality. The reason for this is easily explained. In germination tests using random samples of Woburn barley soil, Brenchley

and Warington (1930) found 150 viable seeds of *Chenopodium album* per 8⅔ square feet. The weed seeds present in arable soils were clearly demonstrated in this work. That weed seeds are present even in soil long covered by sod was shown by Chippindale and Milton (1934). It was found that in the soils of pasture lands there is often little "relationship between the vegetation of the area and the seed flora of the soil". Any disturbance of the soil serves immediately to increase the numbers of common annual weeds. They further state, "It is clear that were the existing sward to be destroyed the flora of this field would immediately become typical of arable land." Among the seeds commonly found were those of *Prunella*, *Chenopodium*, *Polygonum*, *Rumex*, *Plantago*, and *Trifolium*. Although this work was done in England, we find all of these genera represented in Michigan and plants belonging to at least five of them produce food used by winter birds. If similar work were done here, ragweed "seeds" undoubtedly would be found to be present. An experiment started by W. J. Beal in 1879 and continued by H. T. Darlington indicated that seeds of some of the common weeds may remain buried and viable for at least fifty years (Darlingtor, 1930).

Summary

These studies have shown that where it is desired to produce a supply of food that will be available to pheasants and quail throughout the winter, corn is probably the only grain in which we can place complete confidence at present. Where fall and early winter foods for all birds are wanted, a mixture of small grains was found satisfactory, but cultivation without planting is probably the most economical method for the results obtained.

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Allegan, Mich.

E. B. WEBSTER, PIONEER ORNITHOLOGICAL PUBLISHER

BY FRED J. PIERCE

Birds do not change through the years; they seem never to grow older. Fifty years ago in Howard County, Iowa, Red-winged Blackbirds sang from swaying cattails in the marshes, Meadowlarks built their arched nests in the grasslands, Song Sparrows trilled gaily from the banks of the streams, Crows and Jays assailed the Great Horned Owl from the depths of the woodland—and other activities in the bird world went on much as they do today. There was the same call of the outdoors for the young person who had ears to hear it—the same thrill of discovery was offered the budding ornithologist.

A Howard County youth heard the call of the outdoors. We do not know when he became interested in birds, nor what feature of the outdoors first attracted him. Nature is only a step away from the country town resident, and if he has a spark of interest in natural history, an enthusiasm is likely to be kindled. In this youth an interest was aroused early in life. Ample fuel was provided by rambles into the country surrounding Cresco, and his fire of enthusiasm burned brightly throughout his life.

This young man was Edward Barton Webster. He was born at Cresco, Howard County, Iowa, on October 29, 1868, the son of Mr. and Mrs. W. B. Webster. The father was a newspaper man, engaged in the publication of a pioneer Iowa newspaper, the Cresco *Republican*. Young Webster attended the Cresco schools, helped his father in the printing shop after school hours and during vacation days, and spent as much time as he could in the woods and fields in a search for birds and other objects of natural history in which he had come to take a keen delight. In his advanced 'teens he had taught himself the art of taxidermy, had made extensive nature studies and, vocationally, had learned the printing trade.

Most young bird students sooner or later desire expression through the printed page. Their observations have been intensely interesting to them, their records have seemed to be important and, therefore, to justify publication. They seek a publisher. Ornithological journals, both major and minor, have always contained proof of this. The youth of a half century ago was no different from the youth of today. Young Webster wished to express himself ornithologically. He did not send his articles away to be published. He would publish his own bird magazine! For a boy who knew the printing trade, who had access to a printing plant, and who had grown up in a publishing environment, this decision is not to be wondered at.

The late eighties had seen the rise and fall of numerous minor natural history serials, among them the *Acadian Scientist*, the *Agassiz Companion*, the *Collectors' Science Monthly*, *Field and Forest*, the *Hawkeye Observer*, the *Milwaukee Naturalist*, the *Sunny South Oologist*, and the *Young Ornithologist*. Unlike present times, when a mimeographing outfit is the chief requisite for projecting a small bird magazine, these serials had been brought out laboriously through the medium of hand-set type. Careful thought and much energy had gone into their making; but the going had been rough and the ventures had been discontinued.

Early in 1888 young Webster was ready to publish his magazine, and *The Hawkeye Ornithologist and Oologist* was born. At this time the *Auk* was four years old, the *Oologist* was the same age, while the *Wilson Bulletin* and *Bird-Lore* were not in existence. Research shows the field of natural history magazines to have been quite well crowded at that time; many journals were published in various parts of the country, and many more were to be started during the following decade. The careers of nearly all these publications were brief, though they indicated a fairly widespread interest in natural history subjects among the young people of that period. It is decidedly to the credit of E. B. Webster that his product soon attained a limited national circulation and he was able to attract a clientele of sincere young students, a number of whom developed into well known scientists and achieved distinction in later years. Begun in a country town in Iowa, by an unknown young man, the new ornithological magazine was well received from the first. It exerted a good influence in the cause it espoused and clearly justified its existence.

The first issue of *The Hawkeye Ornithologist and Oologist* appeared under date of January, 1888. We find this announcement on the editorial page: "We've Commenced. Magazines have been published for the suppression of evil, for the diffusion of general knowledge, for the interests of fashion, for the benefit of the needy, for the good of various causes, for the advancement of business interests, for the advocacy of certain principles, for the defense of the innocent, for the justification of wrongs, for the comfort of the afflicted—this magazine is published for 50 cents per annum."

The name of F. D. Mead appears with that of Webster as co-publisher. The extent of his coöperation is not well outlined, and we do not know his age or much else about him. He dropped out of the venture with the September issue of 1888. The editorial page states that it is "A Monthly Magazine Devoted to Ornithology and Kindred

EDWARD BARTON WERSTER, 1868-1936

Subjects, and Geology." There is a table of subscription and advertising rates, and the address of a "General Agent" in New York City is given. It is a neat little magazine. The format is very similar to the *Oologist* of the same year. The January issue has sixteen pages of text and a rather attractive pink cover. The page size is about 6x9 inches; the type page is approximately 4½x7 inches, double-column in 8-point type with occasional display headings and a few woodcuts. It was printed on single sheets, two pages on a side, which were folded in the middle to make four pages; four of these sections stapled together with cover made up the sixteen-page issue.

The initial number contains bird articles by Oliver Davie ,Wm. L. Kells, L. O. Pindar, E. G. Ward, H. W. Davis, and the editor. H. F. Hegner begins a continued article on "Home Science", L. W. Stilwell writes of the geology of the Bad Lands of Dakota, and there are articles on egg-collecting, taxidermy, and the taking of leaf photographs. An article on the Bobolink is reprinted from *Forest and Stream*, and there is an item on the Audubon Society which had been sponsored by the same magazine not long before. Three poems round out a varied and interesting issue. An advertising page is headed by this advice: "He who by his biz would rise must either burst or advertise." Advertisements from four states follow, and a full page is devoted to Davie's *Egg Check List and Key to the Nests and Eggs of North American Birds.* Young Webster and Mead had purchased the entire remainder of the second edition of this book and were selling it for one dollar a copy.

The little magazine progressed steadily. The February issue had twelve text pages, the March issue had twenty-two, the April issue had sixteen. The articles were well written and contained good ornithological material. The printing was carefully handled. Considering the great amount of hand-set type required for a magazine of this size, it is remarkably free from typographical errors. No doubt the youthful editor set most of the type himself, and this work on his own magazine was much nearer his heart than the work on his father's newspaper. Beginning in March the pages were sewed together, evidently on a sewing-machine, instead of being stapled. Occasional articles were reprinted from other publications, and we find "filler" items in the corners of many pages; letters from various parts of the country complimenting the new bird magazine from the Hawkeye State were given a few pages of space. This filler item will bring a smile: "How many sticks go to the building of a Crow's nest? None; they are carried to it." Three lines of type were needed to fill a column; the young compositor with a sense of humor decided that this would

do; the column was filled, he had stuck to the text, his purpose was served. The patronage of advertisers continued to be generous, and most of the issues devoted two or more of the cover pages to advertising the various things offered to nature students in those days—birds' eggs of all kinds, embalming fluid for bird specimens, books, Indian relics, fossils, caged song-birds, and nature magazines. A page of exchange notices with requests for books, postage stamps, and old coins has quite a modern ring. The advertising is nearly as interesting reading as the text pages.

In the May issue of 1888 a change was made in the size of the magazine. The type page was increased to 5½x8½ inches. The double-column arrangement was retained, but larger type was used. The margin on the sheet was widened so that the magazine was about 9x12½ inches in size. It was now necessary to print on single sheets, one page on each side, which were sewed or stapled together. The new format carried an engraving of the Snowy Owl on a greenish-blue cover, while the title of the magazine was abbreviated to "H-O-O!" and printed just below the owl as though it were an exclamation from this bird. The editorial statement now informed readers that it was "A Monthly Magazine Devoted to Ornithology, Oology, Taxidermy, Conchology, Mineralogy and Natural History." Subscription rates remained at fifty cents a year, sixty-five cents to foreign countries, and five cents a single copy. Advertising rates were "Made known on application. Send for estimate. They will pay." A second-class mailing permit was granted by the Cresco post office beginning with the June issue of 1888. The number of pages varied from eight to twelve in the new size. November and December were combined into one issue and closed the first volume with 134 pages, covers not included. The enlarged size was used until the end of 1888. Volume II (1889) was begun in the former small size, though a single-column page was used.

There is not sufficient space here to review the various bird articles that appeared in the *Hawkeye Ornithologist and Oologist*. A glance at the titles and authors will suggest the varied contents, and a partial list is given below. "Canadian Flycatchers", Wm. L. Kells; "Bird Nesting in the North of England", Walter Raine; "Carolina Wren", J. W. Jacobs; "Habits of Some American Grebes", Oliver Davie; "Notes on Some of the Passers of Fulton Co., Ky.", L. O. Pindar; "The Traill's Flycatcher", James B. Purdy; "The Bobolink", Frank L. Burns; "American Woodcock", Will C. Brownell; "Foot Movements in Birds", R. M. Gibbs, M. D.; "The King Penguin", W. H. Winkley; "The White-rumped Shrike in Western New York", Neil F.

Posson; "Nesting of the Sharp-tailed and Seaside Finches", C. S. Shick; "Nidification of the Osprey", Walter Raine; "Nesting of the White-breasted Nuthatch", J. Warren Jacobs; "Crow Nesting", Ulysses R. Perrine; "Birds of Greenbrier Co., West Va.", Thaddeus Surber (an annotated list of 121 species); "Notes from Charleston", J. Drayton Ford; "Nesting of the Maryland Yellow-throat in Southwestern Pennsylvania", J. Warren Jacobs; "Birds of Summerville, S. C.", J. D. Ford; "Nesting of the Kentucky Warbler in Southwestern Pennsylvania", J. Warren Jacobs; "My First Owl's Nest", W. C. Brownell; "The Red-Tail Hawk as a Pet", Fred Jones; "The Birds of Miner Co., Dakota", Frank A. Patton; "My First White-winged Crossbill", W. S. Johnson; "A Snipe Hunt", J. Claire Wood; "The Northern Shrike", Neil F. Posson. The editor conducted a bird migration department, and migration tables were given for Cresco, Iowa (Webster); Bernadotte, Illinois (Dr. W. S. Strode); Medina, New York (Neil F. Posson); Chicago, Illinois (W. E. Pratt); St. Paul, Minnesota (Charles Sonnen); Waynesburg, Pennsylvania (J. W. Jacobs); Jackson, Michigan (Carleton Gilbert). The departments devoted to taxidermy, geology, and other nature subjects had regular contributions in the form of long and short articles, though the theme of ornithology occupied the greater portion of the magazine.

Editor Webster was anxious that his subscribers be treated honestly by persons or firms advertising in his columns, and he kept a vigilant watch, so far as possible, over various transactions. When anyone was found guilty of unethical practices, woe to him, for he would likely find his name and his shady dealings set forth glaringly on the printed page. The editor did not always comment on these matters, but he let his subscribers say what they wished about persons who had played the game unfairly, and he evidently printed their letters verbatim! Several exposures of this sort appear in Webster's magazine, and we find a number of caustic but very sincere characterizations, such as these: "We have the name of —— on our deadhead, snide list . . . After proving he was a liar . . . His promises were worthless and from our experience with him we brand him a liar and a scoundrel." "I have written him several letters since sending scalpel, to which he pays no attention. I guess I am out about $16.00 in eggs. So you see he is an all-around cheat and scoundrel." These excerpts are taken from two different issues and are portions of letters addressed to the editor.

In the February issue of 1889 (Vol. II, No. 2) a new cover design took the place of the "H-O-O!" of the Snowy Owl. The new en-

graving shows a raptorial bird (European Buzzard taken from Coues' *Key*) sitting on a post, with shocks of grain on either side and a shield-shaped frame around the drawing. Above the shield is the title, *The Hawkeye O. and O.* Below the shield are shown three swallows in flight, a large egg, and a nest containing eggs. Openings were left in the engraving for the insertion of the publisher's name and address, subscription rates, volume number, and month. Inside the cover we find it stated that it is "The leading ornithological journal of the Western States . . . Successor to the 'Geologists' Gazette' of Elkader, Iowa. Geological Department a leading feature . . . Papers desiring to suspend can have their lists filled by us at very low rates." The hopes of the editor were high. He says: "Our support has been far better than we expected, fully ample to warrant continuance through coming years and we commence the second volume with the feeling that we can present the bird students of the Western States with more and better reading matter for the money than any other publisher."

The magazine had run through the September issue of 1889 (with a total of 84 pages for the year) when disaster struck. A fire swept through the section of Cresco where the Webster printshop was located, destroying the shop and equipment, young Webster's small museum, and his ambitions for continued publication. "The fire that destroyed that part of the town wherein I had my shop seemed at the time to be the blow that almost killed father", he wrote in later years. The task of re-establishing the newspaper business proved so great that the suspension of the *Hawkeye O. and O.* became permanent, and the Iowa bird magazine of the eighties passed out of existence. No doubt the stock of back numbers was also destroyed in the fire, which may account, in a small degree, for the excessive scarcity of complete sets of this magazine. Today the *Hawkeye O. and O.* is a rare collectors' item, for which there is considerable demand. There appear to be only a few complete sets in existence. And I have heard of perhaps a half dozen sets that lack a few issues of completeness; my own set is in this class. Webster's only further connection with ornithological printing seems to have been in 1895-96 when the Webster firm printed several issues of *The Iowa Ornithologist* for the Iowa Ornithological Association.

After the fire young Webster was engaged in the newspaper business and continued to live at Cresco until 1900. He married Miss Jessie Trumbull of Cresco. Their children were a son, Charles, and daughters Dorothy Ann, Beth, and Mae. In 1900 the Webster family moved to Port Angeles, Washington, where they lived two years. The

next two years were spent at Port Townsend, and for a time Webster published a small weekly magazine known as *Webster's Town Topics* at that place. Returning to Port Angeles in 1904, he joined with his father in purchasing a newspaper in that city. During the rest of his life he participated actively and successfully in the newspaper business in Port Angeles; for many years he published the *Evening News*, a daily, the owner of which he remained until his death. In a reminiscent vein he wrote to me of the old *Hawkeye O. and O.* in 1933: "I had a lot of fun getting it out and made a number of very good friends through the work. It was issued monthly, usually 12 pages, and, believe me, that was a task in those days of hand-set type and a 'two-pages-at-a-time' job press. I often think, when I step into the shop where there are five linotypes and six presses and a bunch of men each of whom earns as much in a day as we did in a week in the old days, that I surely was one of those that were 'born thirty years too soon'. At that, I remember I wasn't anywhere near as tired of the work as I might have been . . ." Continuing, he wrote: "I have never lost my interest in birds. As a matter of fact, I think seeing my first Purple Finch in a patch of heather on a mountain ridge, and my first Hepburn's Rosy Finch at the edge of the ice at the top of a glacier, gave me fully as much pleasure as did the Swallow-tailed Kite I collected in Iowa or the first pelicans I saw in Dakota."

Webster did not let his newspaper work in Washington interfere with the outdoor pursuits that he so much enjoyed. He was active in organization work, was a charter member of the Pacific Northwest Bird and Mammal Society, and one of the founders of the Klahhane Club, which through his publicity and personal direction became one of the leading mountain-climbing organizations in the Pacific Northwest. The club established a headquarters lodge at the first rise above Heart o' the Hills, and fifty or sixty members were often present on week-end trips. Later, the club took over the operation of a tract on Lake Crescent, which Webster developed into beautiful Klahhane Gardens containing an abundance of mountain flowers and plants. A peak on Mount Angeles was named in his honor, and a flower, *Senecio websteri*, found only on Mount Angeles, was named for him. At the time of his death he was working on the Klahhane Museum, which he had been instrumental in establishing. The Webster tract near Mount Angeles was somewhat of a showplace and illustrated admirably the things in which its owner was most interested. There, in a small valley at the foot of the mountain, he had a natural rock garden in which he had planted over a thousand varieties of mountain and prairie

plants. A mountain stream crossed his place from a lake of six acres; at this lake he kept many species of wild ducks in summer, and it contained over five thousand trout. The first step up the mountainside began beside his door, and the scenery there was of the finest. He did much entertaining, and fortunate were those who were privileged to enjoy the hospitality at this mountain retreat. Artists used the wild ducks on his lake as living models for their drawings, botanists came there to study the abundant flora, biologists, ornithologists, and mammalogists came to accompany him on his trips. "You see," he said, "it is an easy matter for me. They have merely to drive out to my place at the foot of the mountain, five miles from the water-front to the peaks of Mount Angeles, 7,000 feet elevation, and stay overnight. In the morning the packs are put on the ponies and we take the four-mile zigzag trail to the top, when, by means of 3500-foot grass ridges connecting the various mountain tops, we can travel all summer, if we wish, and not retrace our steps."

Webster achieved a reputation as a botanist. He had a herbarium of some 2500 sheets, which represented plants from all the mountains of Washington. He also had a considerable collection of mammal skins. As a writer he was always in his element. Besides numerous articles on nature studies, he produced three books. One was "The Friendly Mountain", an intimate word-picture of Mount Angeles, another was "Fishing in the Olympics", composed of a group of fishing anecdotes, and the third was "The King of the Olympics". The last named book resulted from his serious study of elk and other mammals of the Olympic peninsula. It is an authoritative book of 225 pages and fifty illustrations, and the edition was soon sold out.

E. B. Webster died at his home at Port Angeles, Washington, on January 7, 1936, following an illness of three months. During his lifetime he made a particular effort to show others the beauties of the world of nature—first through the medium of the *Hawkeye Ornithologist and Oologist*, and later through his books, his zoological gardens and museum, and his excursions with friends. His acquaintance was an inspiration to all whom he met; his friendly teachings were invaluable aids to those who wished to learn more of nature. The accompanying photograph is very typical and shows him in one of his happiest rôles, gathering wild flowers on the summit of Mount Angeles—the friendly man on "The Friendly Mountain".

WINTHROP, IOWA.

EDITORIAL

The TWENTY-THIRD ANNUAL MEETING of the Wilson Ornithological Club was held in Indianapolis on November 27-28, 1937. As predicted, it proved to be the largest meeting we have ever held. We hesitate to say it was the best, simply because we have had many excellent programs in the past, and comparison would be difficult. Plans for the meeting had been very carefully laid, and everything connected with the meeting moved along with smoothness and precision. Much of the success of the program was doubtless due to the fact that our officers had arranged for the rental of our own projection apparatus, which was constantly on hand and ready for use.

The following figures give a statistical summary of the organization for the past five years:

	Columbus 1932	Pittsburgh 1934	St. Louis 1935	Chicago 1936	Indianapolis 1937
Local Attendance	92	49	24	62	60
Out-of-town Attendance	65	129	88	70	178
Total Attendance	157	178	112	132	238
Dinner Attendance	69	72	70	54	100
Titles on the Program	35	39	38	26	41
Honorary Members	7	6	6	5	5
Life Members	10	12	11	11	9
Sustaining Members	75	44	42	40	41
Active Members	175	154	189	212	187
Associate Members	469	507	538	640	596
Total Membership	739	721	784	906	838
New Members Added	113	112	141	170	150
Pages in BULLETIN	256	288	318	336	320
Total Income	$2191	$2230	$2494	$2222	$2212
Fiscal Balance	$547	$842	$767	$581	$395

SINCE we have no reviews in this number, we take the liberty of mentioning the new work by Dr. Witmer Stone entitled "Bird Studies at Old Cape May", issued in January, 1938, though dated 1937. The work consists of two volumes, totaling 942 pages, 120 plates, and many text figures, and sold for $6.50 postpaid. Besides being a record of the occurrence of species along this portion of the Atlantic coast, the pages abound with Dr. Stone's observations on the habits of the birds, many of which occur in other parts of the country.

ERRATUM. The date of birth of John Maynard Wheaton was May 13, 1840, rather than May 18, as erroneously stated in the WILSON BULLETIN of December 1937, page 276. This was a typographical error. Those who preserve their Bulletins are invited to make this correction.

GENERAL NOTES

Conducted by O. A. Stevens

Eastern Warbling Vireo in Colorado.—The Eastern Warbling Vireo (*Vireo gilvus gilvus*) is a breeding bird in southeastern Colorado (Trinidad, Las Animas County, and Manzanola, Otero County) and occurs at Holly, Prowers County in migration, according to Dr. Harry C. Oberholser. The specimens listed below, identified by Dr. Oberholser, are in the collection of the Colorado Museum of Natural History.

No. 2190—♂ Trinidad, Las Animas County, May 24, 1910, L. J. Hersey.
No. 2844—♀ Holly, Prowers County, May 16, 1913, F. C. Lincoln.
No. 6160—imm. ♂ Holly, Prowers County, September 12, 1916, F. C. Lincoln.
No. 13889—♂ Manzanola, Otero County, June 17, 1904, H. G. Smith.
No. 13893—Cresswell, Jefferson County, June 9, 1887, H. G. Smith.
No. 14725—♀ Manzanola, Otero County, June 17, 1904, H. G. Smith.

—Alfred M. Bailey, *The Colorado Museum of Natural History, Denver, Colorado.*

A Prairie Falcon and American Rough-legged Hawk Fight.—An interesting battle between a Prairie Falcon (*Falco mexicanus*) and an American Rough-legged Hawk (*Buteo lagopus s. johannis*) was witnessed by the writer on the Crescent Lake Waterfowl Refuge in Garden County, Nebraska, January 31, 1937. For several weeks each bird had occupied a rather definite feeding territory, the two areas being contiguous; but on this day the smaller but swifter falcon attempted to drive away the other bird. One might expect him to win but it wasn't a short battle at all. The falcon would fly up above his larger relative, to seek the same position of advantage that one airplane wants over another in war, but instead of raking with bullets at each sweep he intended to do it with his powerful talons. The rough-leg, however, trained in war for his own existence, met each swoop by skillfully turning over on his back in mid-air, maintained his upside-down attitude with hovering wings and met the falcon's talons with ones even more powerful. It was a pretty battle between two expert aviators! Time after time the falcon attacked, and time after time the rough-leg repulsed, until the former gave up and flew northward to his own feeding grounds leaving the latter to proceed leisurely on his own food quest. His precious territory had been saved!—Walter W. Bennett, *Ellsworth, Nebr.*

A Plucking Experiment with White-crowned Sparrows.—The two common post-juvenile plumages of the White-crowned Sparrow (*Zonotrichia leucophrys*) are characterized by black and white crown stripes in the one case, brown and buff in the other. The former is generally recognized as characteristic of birds past the first prenuptial molt, the latter of birds in their first winter plumage. At Davis, California, the immature type of crown in *Z. l. pugetensis* is replaced by black and white feathers between February 25 and April 10. A similar though somewhat extended season of crown molt is described by Law (*Condor*, 31, 1929, pp. 208-212) for *Z. l. gambeli* in Southern California.

In handling some 366 live specimens of *Z. l. pugetensis* at Davis during the winter seasons of 1935-36 and 1936-37, it was noticed that a large percentage of

the brown-crowned individuals possessed a scattering of black feathers in the head stripes. Since these were particularly noticeable in the regions of heaviest wear, it was assumed that they were replacements growing where the normal immature feathers had been lost through accident. As a check on this assumption, the feathers of the right coronal stripe were removed on three brown-striped (immature) birds taken on October 27, 1936, and on three taken on November 22, 1936.

Banded birds with asymmetrical black and brown crowns were noticed in the vicinity of the traps on December 21 and were seen on numerous occasions during

FIG. 14. Dorsal view of the heads of winter specimens of Puget Sound White-crowned Sparrows (*Zonotrichia leucophrys pugetensis*) taken at Davis, California. The first is a normal immature bird, with a few black feathers in the crown; the second, an immature bird in which the right crown stripe had been plucked; and the third, a normal adult bird.

January and February. One of these (37-120625), collected on February 10, 1937, proved to be one of the plucked birds banded October 27; another (37-120652), trapped and liberated on February 17, was originally taken and plucked on November 22. In both cases the plucked brown feathers of the immature type had been replaced by jet black feathers indistinguishable from those found in typical adult birds. The contrast between the normal brown stripe on the left and the artificially induced black stripe on the right was very striking (Fig. 14). "Bicolored" birds were seen on three subsequent occasions before March 20 when the normal crown molt had practically obliterated these artificial marks of identification.

This simple experiment suggests that the physiological or genetic factor which determines the plumage type (whether immature or adult) is potentially present in the White-crowned Sparrow by the time the bird has reached five months of age, and will produce typically adult crown feathers at least four months before the first prenuptial molt would normally exteriorize it.—JOHN T. EMLEN, JR., *Division of Zoology, University of California, Davis, Calif.*

Mockingbirds in Western Iowa.—Two Mockingbirds (*Mimus polyglottos*) were observed at Luton, Iowa, about five miles east of Brown's Lake in Woodbury County on August 5, 1937. They first attracted my attention by their song, which I mistook for that of a Catbird. When the buzzing song of a Grasshopper Sparrow issued from the same spot I decided to investigate. The birds were found perched in full view in the top of a box elder tree. The second bird was not singing nearly as much as the first. My brother and I followed the first bird for about half an hour during which time it imitated the Mourning Dove, Red-headed Woodpecker, Bob-white, and Blue Jay, as well as the Grasshopper Sparrow which is quite common in the pasture adjoining the feed lot trees where these birds were seen. I uncovered three nests of the Grasshopper Sparrow while mowing the pasture the week of June 21-26. One Mockingbird was seen again in the afternoon and while it sang many notes which we could not identify with those of any other bird, it did no imitations that we had not heard that morning. The next day they could not be found.—Wilfred D. Crabb, *Sioux City, Iowa.*

Unusual Shore Birds in Jefferson County, West Virginia.—The Federal Fish Hatchery at Leetown, West Virginia, has some forty acres of breeding ponds. During late August these ponds are drained, leaving an expanse of mud quite suitable for shore birds. Migrants that are unusual, or rarely seen in the surrounding country, are often quite common on the mud flats at the hatchery. A rather heavy and varied migration of shore birds was noted here this fall. Three species seem worthy of note:

Red-backed Sandpiper (*Pelidna alpina sakhalina*). One was seen October 14, 1937, feeding in company with Pectoral Sandpipers (*Pisobia melanotos*). From October 15 to 17, two individuals were seen. The only other record for this species in the state is a bird found dead at Weston, Lewis County, in November, 1914, which was identified by E. A. Brooks.

Eastern Dowitcher (*Limnodromus griseus*). Two individuals stayed at the hatchery from October 14 to 17, 1937. They were observed each day, and often were feeding with the red-backs. So far as I know the only other records are: P. C. Bibbe saw several at Lake Terra Alta, Preston County, on May 5, 1926; and Maurice Brooks saw large flocks in Barbour County on September 5, 1935.

Wilson's Phalarope (*Steganopus tricolor*). I collected a male of this species at Leetown on September 4, 1937. It was feeding in company with Lesser Yellowlegs (*Totanus flavipes*). The specimen is now in the museum of West Virginia University. Other records for the state are: A. S. Morgan collected one along the Great Kanawha River in August, 1930; the group at Oglebay Park in Wheeling reports having seen an individual in the Northern Panhandle on May 4, 1935. —J. Lloyd Poland, *Martinsburg, W. Va.*

The White-rumped Sandpiper in Illinois.—Because the White-rumped Sandpiper (*Pisobia fuscicollis*) is regarded as a rare migrant throughout most of Illinois, the writers consider it worth while to summarize the following unpublished records of this species in Illinois, peculiarly significant in that all were noted in 1936.

Frank Bellrose, of Ottawa, observed some twenty-five individuals on the mud flats of Sawyer Slough along the Illinois River several miles below Lacon on June 6, 1936; these were intermingled with a large flock of Semipalmated and least Sandpipers.

Richard Allyn, of Waverly, reported seeing two individuals of this species on the mud flats of Lake Springfield at Springfield on August 29, 1936.

For the Chicago region, season-report records of the Chicago Ornithological Society list three records for 1936 (none for 1937), which are as follows: Waukegan, May 17 (Pitelka); Lincoln Park, August 15 (Clark and Black), and October 10 (Clark and Dreuth).

Through the kind permission of Albert J. Franzen, of the Field Museum, Chicago, the writers include the record of a specimen, a female White-rumped Sandpiper, which he obtained on August 30, 1936, at Lake Calumet, Cook County, Illinois.—FRANK A. PITELKA and FRANK C. BELLROSE, *University of Illinois, Urbana, Illinois.*

Coot Swallowed by Fish.—It is an accepted fact that fish are at times consumed by ravenous birds—much to the annoyance of the fishermen. That birds are at times the prey of fish is a novelty of which we know little. An example of the latter case occurred at Lake Apopka, Florida, on November 18, 1937, when Messrs. Charles Helin and Irving Short were fishing for big-mouthed bass. Mr.

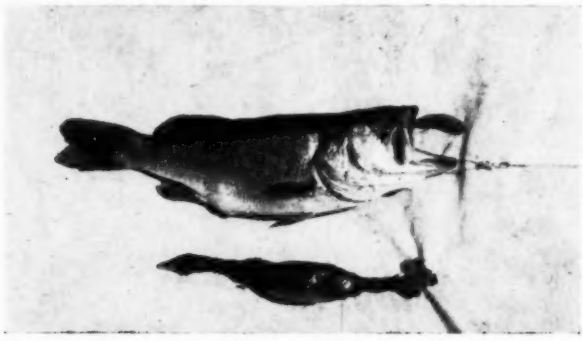


FIG. 15

Short was doubly surprised when he hooked a twenty-four inch bass with the legs of a freshly swallowed full-grown Coot still protruding from its mouth. In reporting this unusual incident, Mr. Helin wrote that the bass weighed eight pounds with the Coot and six and three-fourths pounds without it. The Coot was seventeen inches long (from beak to out-stretched legs) and weighed one and one-fourth pounds. (See photo). It was probably captured head first while diving for food.—CLARENCE COTTAM, *U. S. Biological Survey.*

Song Sparrow Records from the Grand Canyon in Northern Arizona.—With reference to Mr. Monson's note on the Song Sparrow in Arizona, (WILSON BULLETIN, 1937, p. 295) I wish to call attention to the fact that in my "Check-list of Birds of Grand Canyon National Park", published in July, 1937, by the Grand Canyon Natural History Association, it is stated that Song Sparrows have been seen on the North Rim, South Rim, and in the Canyon Bottom, as well as in Toroweap Valley in Grand Canyon National Monument. A specimen of the Mountain Song Sparrow (*Melospiza melodia fallax*) was collected by A. E. Borell at Neal Springs on the North Rim on September 16, 1934 (Grand Canyon Collec-

tion, No. B-129). Dr. Oberholser states that the canyon is in the range of *fallax*, thus no other subspecies is believed to be in that region. However, Song Sparrows *lighter* in color than the Borell specimen have been frequently observed in the Canyon Bottom and have been known to breed there. It is very likely that this is the Desert Song Sparrow (*M. m. saltonis*), but specimens must be secured for complete identification.—Russell K. Grater, *National Park Service, Denver, Colo.*

The Canada Warbler Breeding Near Toledo, Ohio.—On July 10, 1937, at the eastern bank of a small valley in the "Oak Openings", Swanton Township, Lucas County, I found a male Canada Warbler (*Wilsonia canadensis*) feeding a fledgling a few days out of the nest. Because of the heavy foliage I was unable to collect the young bird and therefore did not take the parent. The fledgling was not seen again, but on July 18 I found the adult female.

This evidence of nesting was not entirely unexpected as I had found singing males in Lucas County on June 20, 1931, in Swanton Township; on June 24, 1931, in Springfield Township; and on June 16, 1935, at the same location in which the breeding bird was found. This last individual was seen and heard by several members of the Cleveland Bird Club who were with me at the time.

According to Dr. Lawrence E. Hicks this species is known to breed otherwise in Ohio only in Ashtabula County ("Distribution of Breeding Birds of Ohio", 1935).—Louis W. Campbell, *Toledo, Ohio.*

Nesting of the Least Tern in Iowa.—Some question has been raised relative to the status of the Least Tern (*Sterna antillarum*) in Iowa. The fourth edition of the "A. O. U. Check-List" records it as breeding "...on islands in the Mississippi and Missouri river systems (formerly at least) to South Dakota and Iowa..." DuMont, in his "Birds of Iowa", says, "An uncommon summer resident...with reports of former breeding in Cerro Gordo and Pottawattamie Counties and probable nesting in Lee County....Youngworth (Wilson Bulletin, XLII, pp. 102-103) recorded the breeding of this tern in the Sioux City region..." Youngworth saw young terns flying with adults but did not actually find the nests. Circumstances, however, led him to believe that the young were hatched near by.

With T. C. Stephens and W. W. Trusell I have been able to make some interesting observations on the breeding of the Least Tern in Woodbury County, Iowa, and Dakota County, Nebraska. During July and August, 1937, we found a total of fourteen nests, twenty-nine eggs, and two fledglings on the sandbars of the Missouri River. Eleven of the nests were in Dakota County, Nebraska, and three were in Woodbury County, Iowa. We took some thirty or forty photographs besides collecting two eggs and two adult terns.—Bruce F. Stiles, *Sioux City, Iowa.*

Whooping Cranes in Southwestern Missouri, 1937.—On October 19, 1937, Mrs. Fred A. Cahill of Branson, Taney County, Missouri, wrote to Mr. I. T. Bode, Director of Conservation, concerning a large bird which, with two young, had spent the summer along Roark Creek, a stream entering the western end of Lake Taneycomo. Mr. Bode sent me the letter, and subsequent correspondence with Mrs. Cahill has convinced me that her birds were an adult and two young Whooping Cranes. In view of the unusual nature of this record, it seems best in the following account to quote rather extensively from her letters.

A single large, pure white bird with black wing-tips was first seen in late May or early June; the exact date was not recorded. It was seen thereafter by

Mr. and Mrs. Cahill and several neighbors; the wing-spread was estimated at from five to seven feet. On one occasion, the bird "flew into the very top of a dead tree where I could see her perfectly, silhouetted against a green hill beyond. The head is not large—about in proportion of a swan's head to its body. The neck is long and is S-curved—very graceful—the beak is yellow and not much longer than the depth of the head. It flies with the neck extended straight out."

Its calls were of two kinds: (1) A very loud, "rhythmic and rather musical trumpeting—'Tooooo-t-to-toooo' (pause), then repeated with the last note on a descending scale." (2) A savage cry "like the fighting challenge of the grandfather of all fighting tom-cats. Their snarling cry is the one they make when stationary, and the continuous musical trumpeting seems to be their flying note. The snarling cry never changes position or direction and is not very frequently made. We could place the bird by that note; then when it flew we could follow it by the continuous rhythmical trumpeting, which was always from the hatchery west up the creek, anywhere from midnight to three or four o'clock in the morning."

The two young birds were not seen until "after the wheat had been cut", which according to our College of Agriculture was after July 20, 1937, in Taney County. They were first seen by Mr. Cahill one morning at daylight in a wheatfield; he reported that they were "about the size of a good big hen and able to fly". Thereafter they regularly accompanied the old bird on nightly trips to the state fish hatchery, "squawking and trying to imitate her cries".

"After the young birds could fly, we heard the mother bird fly west, evidently from the fish hatchery, where we could hear her give her savage, snarling cry.... When she flew upstream she kept up her rhythmic trumpeting, seemingly almost in time to her wing-beats, there was such regularity about it. The young birds were some distance upstream, because loud as her note is the sound would fade away in the distance and be lost. Then in fifteen minutes or so it would come faintly within hearing again and increase in volume as she approached, and with her the young squawkers. She evidently parked them in a hideaway somewhere upstream and took them each night to the hatchery to feed.... But in the early fall (September) she and the young birds deserted their hideaway seemingly, and made headquarters somewhere on the (White) river farther away, though still where we could hear all three trumpeting and whooping every evening."

The adult and at least one young bird were still about on November 25, and the adult was last heard at 6:15 A. M., December 2.

Such an occurrence as this calls for some theorizing. If the young birds were hatched on their Canadian range (egg-dates May 9 to June 2, according to Bent, 1926, pp. 220-224), they must have migrated south before the middle of July. In view of their size when first seen, this is highly unlikely; also, the old bird was seen and heard for over a month before there was any evidence of the presence of young. If, however, the birds were hatched at or near their summer location, much still remains to be explained. Why only one adult? Why did nesting take place here at all?

The following theory, some points in which were first suggested by Mrs. Cahill, is presented as the only one that appears to the writer to fit the facts: Mating occurred during the spring migration; one of the adults was wounded, stopping the northward journey; nesting began and the wounded parent died, leaving the other (probably the female) to incubate the eggs and rear the young.

There are no extensive marshes in this part of the Ozarks, but the streams are subject to floods and frequently change their courses, leaving temporary and local overflow marshes in one of which a nest-site may have been found.

Word of this unusual occurrence was not received until November, when it was impossible for the writer to make the 225-mile trip to investigate it. Consequently no search for the abandoned nest was undertaken, and under the circumstances it is entirely unlikely that the birds will return next year. Meanwhile the known facts constitute a valuable record, and one can only be thankful that these birds escaped the perennial warfare of state fish hatchery employees against fish-eating birds.—RUDOLF BENNITT, *Professor of Zoology, University of Missouri, Columbia, Mo.*

The English Sparrow and Highway Mortality.—On an automobile journey from Albany, New York, to Iowa City, Iowa, and return, August 28-31 and September 7-10, 1937, a round-trip distance of 2117 miles, the writers again tabulated the vertebrate casualties on the highways due to passing motor cars. The data here presented pertain only to our observations on highway mortality with reference to birds in general and the English Sparrow in particular.

On the entire trip we identified a total of 613 English Sparrow (*Passer domesticus*) carcasses on the highways, an average of .289 casualties per mile for this species. For each state or province in which we traveled the recorded number of English Sparrow casualties ranged as follows: Iowa, 55 for 117 miles; Michigan, 110 for 309 miles; Illinois, 125 for 359 miles; Ontario, 170 for 521 miles; Indiana, 57 for 205 miles; New York, 96 for 606 miles.

In addition to the 613 English Sparrows, we recorded the freshly killed carcasses of 22 native birds representing 13 species, 76 domestic fowls, 1 Ring-necked Pheasant, 1 domestic pigeon, and 277 undetermined birds. It is our opinion that a large proportion of the latter were really English Sparrows. For each state or province in which we traveled the number of avian casualties ranged as follows: Iowa, 79; Indiana, 80; New York, 148; Michigan, 154; Illinois, 216; Ontario, 312.

The total number of avian highway casualties recorded was then, 989, an average of .467 per mile. For the five states and the single Canadian province the average avian casualty rate per mile was: Iowa, .675; Illinois, .601; Ontario, .598; Michigan, .498; Indiana, .390; New York, .244.

Several reasonable conclusions may be drawn from these earlier observations presented by the senior writer (WILSON BULLETIN, XLVIII, 1936, 276-283) on this subject.

1. In spite of the apparently excessive highway mortality rate among English Sparrows, at least in the territory covered by our records, their actual number of casualties here recorded exceeds by more than five times those cited by us for this bird on any previous trip through practically the same region. Our figures show an average of one dead sparrow for each 3.4 miles traveled on tris trip.

2. So far as the section of the country traversed on this journey as well as on our previously recorded ones is concerned, our counts of highway casualties indicate that the greatest density of English Sparrow population lies in the agricultural sections of the Mid-west and southern Ontario. Of the five states and the single Canadian province mentioned in the present account, New York State ranks last in English Sparrow population on the basis of highway mortality counts.

3. Our observations lead us to believe that the heaviest highway toll among English Sparrows is taken not from the individuals feeding on or near the roads

but from the young and more or less inexperienced birds that fly *across* the thoroughfares. Becoming bewildered by the heavy two-way traffic, they often decelerate their flight speed to avoid a car approaching from one direction and are struck by a car speeding in the opposite direction.

4. The greater number of cars now on the highways together with the increased speed at which they are driven is responsible for an ever-ascending rate of avian mortality. The figures cited herein are much higher than we have obtained previously for this particular route or for any other extended motor trip. Our figures show an average of one dead bird for each 2.1 miles traveled on this trip.

5. It is obvious that the highway mortality rate among birds as well as other animals varies seasonally, indeed, probably from day to day. The large number of avian casualties here recorded no doubt was due, in some measure at least, to the heavy traffic associated with the Labor Day (September 6) holiday activities.—Dayton Stoner, *New York State Museum, Albany, N. Y.*, and Lillian C. Stoner, *Albany, N. Y.*

Records of the Woodcock in Iowa.—On November 18, 1937, I found a pair of American Woodcocks on Glover's Creek, near West Union, in Fayette County. And on November 19, 1937, several Woodcocks were noted on the Cramer farm near the Volga River seven miles southwest of Elkader, in Clayton County. Mr. Cramer told me on that date that he had counted as high as twenty Woodcocks along this spring branch near his house.—W. W. Aitken, *Iowa Conservation Commission, Des Moines, Iowa.*

Interrupted Egg-laying of a Marsh Hawk.—On May 12, 1929, in Jerusalem, Lucas County, Ohio, I found a typical nest of a Marsh Hawk (*Circus hudsonicus*) containing four eggs. I marked the spot and on returning on June 29 found two young almost able to fly skulking in the grass at the side of the nest. These I banded. In the nest were two eggs, and supposing them to be addled, I idly broke one with a stick. Much to my surprise it contained a large embryo indicating that it would have hatched within a few days. The other egg I left untouched but was unable to return again to the nest.—Louis W. Campbell, *Toledo, Ohio.*

Four Ohio Records of Golden Eagle.—The rarity of the Golden Eagle (*Aquila chrysaëtos*) in this section is of enough interest to record the following occurrences. Two were caught in Highland County in December, 1934, one in November, 1937, and one in Adams County in November, 1937. The first, with a wing spread of more than seven feet, was captured on the Herbert Shaffer farm near Lynchburg by Albert Chaney. It was caught by the toes in a trap set for a hawk and six inches away in another trap was a Marsh Hawk (*Circus hudsonius*). The second bird, caught by Bob West on his farm, had an injured leg and a wing spread of eight feet. The third eagle was caught by Bert Campbell along the side of the road on Blue Creek in the southern part of Adams County. Its wing spread was six feet and six inches. The fourth was captured by Mrs. Maude Matthews at Butler Springs. She surprised it in a chicken raid and wounded it with a shotgun. Its wing spread was seventy-six inches. It is illegal to kill the Golden Eagle in Ohio and the four birds were turned over to the proper authorities.—Katie M. Roads, *Hillsboro, Ohio.*

PROCEEDINGS OF THE WILSON ORNITHOLOGICAL CLUB

By Olin Sewall Pettingill, Jr., Secretary

The Twenty-third Annual Meeting of the Wilson Ornithological Club was held, for the first time in its history, at Indianapolis, Indiana, on December 27-28, 1937. Headquarters were located at the English Hotel and the sessions convened in the Ball Room of the Columbia Club. The Wilson Ornithological Club was one of the many organizations meeting in affiliation with the American Association for the Advancement of Science.

Short business sessions were held Monday morning and Tuesday afternoon. The Executive Council met on two occasions, once at the Treasurer's home on the evening of December 26, and again on Monday evening. The program sessions were four in number, there being one each morning and afternoon. The Annual Banquet took place in the Columbia Club on Tuesday evening.

Business Sessions

The short business sessions were called to order by President Josselyn Van Tyne on Monday morning at 9:45 A. M. and on Tuesday afternoon at 4:45 P. M. The minutes of the previous meetings were approved without being read since they had been published previously in the Wilson Bulletin. The reports of the Secretary and Treasurer were read and approved. The Secretary's report showed a total membership of 838. Altogether 150 new members were obtained during the year. The increased interest of members in the organization was shown by the large number of requests for program positions and the satisfactory returns from the questionnaires recently submitted to members. The Treasurer's report announced total receipts from November 25, 1936, to December 24, 1937, of $2,212.31 and total disbursements during this same period of $1,816.97, leaving a balance of $395.34. The total endowment fund of the organization now stands at $2,343.65. This figure is considerably larger than heretofore, the Club having received from the Leon Otley Pindar Estate the stated amount of $843.88. The Editor gave his report making numerous worthwhile recommendations for future issues of the Wilson Bulletin and relating interesting accounts of his various duties during the past year. The report of the Librarian was read in his absence by the Secretary.

The President appointed three temporary committees. They were:

Resolutions, George M. Sutton, O. A. Stevens, Miss Theodora Nelson.

Auditing, W. J. Breckenridge, Lawrence H. Walkinshaw.

Nominating, Lynds Jones, Mrs. H. J. Taylor, Jesse M. Shaver.

The Resolutions Committee presented the following resolution which was adopted by motion:

Resolved, that the Wilson Ornithological Club expresses its gratitude to Mr. Samuel E. Perkins III, of Indianapolis, for his unselfish and untiring activities as Chairman of the Local Committee of Arrangements, to Miss Margaret R. Knox, also of Indianapolis, for her assistance as a member of the Local Committee, to the Indianapolis Chamber of Commerce, the gentlemen of the Press, and the officers of our Club for their generous coöperation in making this, the 1937 meeting, a memorably successful meeting of the Wilson Ornithological Club.

The Nominating Committee offered the following report:

President—Margaret M. Nice, 5708 Kenwood Avenue, Chicago, Illinois.

First Vice-President—Lawrence E. Hicks, Ohio State University, Columbus, Ohio.

Second Vice-President—George Miksch Sutton, Cornell University, Ithaca, New York.

Secretary—Olin Sewall Pettingill, Jr., Carleton College, Northfield, Minnesota.

Treasurer—S. E. Perkins III, 709 Inland Building, Indianapolis, Indiana.

Editor—T. C. Stephens, Morningside College, Sioux City, Iowa.

Additional Members of the Executive Council—

Albert F. Ganier, Nashville, Tennessee.

S. Charles Kendeigh, University of Illinois, Champaign, Illinois.

Miles D. Pirnie, Kellogg Bird Sanctuary, Augusta, Michigan.

The report of the Nominating Committee was accepted by motion and the Secretary was authorized to cast one ballot for the nominees, thus electing them officers of the Wilson Ornithological Club for the ensuing year.

An amendment to Article III, Section 4, of the Constitution was proposed allowing all past presidents of the Wilson Ornithological Club to serve as *ex-officio* members of the Executive Council. The section, as amended, would read: "The officers and past presidents of the Club and three additional members, who shall be elected from its voting members by the Club, shall constitute an Executive Council. The business of the Club . . ." This amendment will be voted upon at the next Annual Meeting.

Meetings of the Executive Council

Numerous important matters were discussed and passed upon during the meetings of the Executive Council.

The Museum of Zoology at Ann Arbor, Michigan, was chosen as the place of the next Annual Meeting. It will be held on Friday and Saturday, November 25 and 26, 1938.

Dr. Emil Witschi, of the University of Iowa, was appointed Council Delegate of the Wilson Ornithological Club to the Ninth International Ornithological Congress at Rouen, France, from May 9 to 13, 1938.

The Secretary was instructed to send out the program of the next Annual Meeting to each member of the Club a week or ten days in advance. This innovation will necessitate mailing the annual letters to members much earlier than heretofore and will require members to submit titles for papers at least three or four weeks prior to the meeting.

The President was authorized to appoint a Program Committee whose primary function will be that of aiding the Secretary in selecting papers and in arranging the various details of the annual meetings. The President was also given authority to appoint an Index Committee to direct plans for publishing an index to the Wilson Bulletin.

Program Sessions

The program sessions began on Monday morning at 9:30 A. M. with an address of welcome by Colonel Richard Lieber, President of the National Conference on State Parks. This was followed by a response on behalf of the Club by President Van Tyne.

Altogether thirty-one papers were presented while four others were given at the Annual Banquet and six others were read by title. An outstanding feature of these sessions was a Symposium on Alexander Wilson led by Mr. Albert F. Ganier, Dr. Gordon Wilson, and Dr. George Miksch Sutton, who discussed ad-

mirably the relative merits of Wilson as ornithologist, poet, and artist, respectively. A large portion of the morning papers were technical; some were illustrated by lantern slides, one by phonograph. The majority of the afternoon papers, on the other hand, were popular in nature and were illustrated with remarkably fine motion pictures in black and white, in color, and with sound.

The program of papers, together with brief abstracts, is given below in the order presented. Due to last-minute changes in the program, the order of papers and the times allotted each paper differ somewhat from the original printed program.

Opening Session, Monday Morning

1. The Contribution of Life History Studies to Taxonomic Ornithology. (8 minutes). Miles D. Pirnie, *W. K. Kellogg Bird Sanctuary, Augusta, Michigan.*

   The values of life history studies were enumerated; and ornithologists should feel a greater appreciation of the work of taxonomists.

2. Interesting Bird Observations at Lexington, Virginia. (7 minutes). J. Southgate Y. Hoyt, *Lexington, Virginia.*

   A report of some rather unusual birds recorded at Lexington, Virginia, containing (1) observations on migration with special attention to numbers of birds passing before the moon at night, and (2) observations on the courtship of a pair of Whip-poor-wills.

3. The Sense of Smell in the Turkey Buzzard. (14 minutes). Victor Coles, *Laboratory of Ornithology, Cornell University.*

   Studies on the senses of sight and smell have been going since the time of Audubon. This author presented the results of his own experiments at Cornell University. (1) Food was presented in a natural set-up. (2) Food was hidden by boxes, newspapers, etc. (3) Food disguised in models. (4) Food hidden in a maze. Results of the experiments seemed to show that (a) the sense of smell is not strong in Turkey Buzzards; (b) both sight and smell aid the Turkey Buzzard in obtaining food, but sight predominates.

4. Woodcock Nesting Studies in Maine. Illustrated by Lantern Slides. (23 minutes). Gustav Swanson, *Division of Entomology and Economic Zoology, University of Minnesota.*

   The Woodcock is a common nesting bird in Eastern Maine where these studies were carried on under the auspices of the University of Maine, the Maine Division of Inland Fisheries and Game, and the U. S. Bureau of Biological Survey. The studies in 1937 of a total of 24 nests and over 50 singing fields of the male resulted in interesting contributions to our knowledge of (1) Woodcock breeding habits, and (2) predation upon Woodcock.

5. Remarks on Vernacular and Subspecific Names. (8 minutes). O. A. Stevens, *North Dakota Agricultural College.*

   The relative stability of common names of birds has been a great satisfaction. Changes have been made from time to time and probably will and should be made. Correlation of subspecific characters with distribution, climate, etc., is an important field of study, but the use of subspecific names, either vernacular or scientific, adds little if not based upon accurate determinations and often is objectionable.

6. Recording Sounds of Wild Birds, Its Study and Uses. Illustrated by Lantern Slides and Phonograph. (31 minutes). Albert R. Brand, *Laboratory of Ornithology, Cornell University.*

   A description of the apparatus and technique of bird sound recording. The following matters are discussed: (1) The methods used in microscopic study of the vibrations of bird song; (2) the educational uses or sound recording, *i. e.*, combined with motion pictures, reproduced on phonograph records and

records for the blind; (3) the "storage" value of sound recording, *i. e.*, making records of disappearing species so that their sounds will be preserved even though they become extinct.

7. A Late Summer Adirondack and New England Coast Bird Trip. (19 minutes). WILLIAM C. BAKER, *Salem, Ohio.*

An ornithological account of visits made to such interesting points as Mt. Marcy, Machias Seal Island, and Monomoy Point. A total of 142 species were observed.

MONDAY AFTERNOON

8. Konrad Lorenz and Bird Behavior. (15 minutes). MARGARET MORSE NICE, *Chicago, Illinois.*

Lorenz's basic principle is the following: All especially striking colors and forms of plumage and special behavior patterns are releasers of instinctive behavior in other members of the species. This is the only hypothesis to explain that combination of simplicity and improbability which is their commonest and most striking characteristic.

9. The Rate of Growth of English Sparrow Fledglings. Illustrated by Lantern Slides. (18 minutes). RICHARD LEE WEAVER, *Laboratory of Ornithology, Cornell University.*

Two topics are considered: (1) The appearance of the young during the fifteen days in the nest. Slides made from photographs show the different stages of development. (2) A statistical analysis of the rate of growth with comparisons of families and individuals by means of graphs and charts reproduced on slides.

10. Mississippi's Quail Conservation Program. (7 minutes). FANNYE A. COOK, *State Game and Fish Commission, Mississippi.*

Quail were found nesting in all but two counties. Ten thousand quail were banded and distributed, one pair to each forty acres.

11. Further Notes on the Nesting Habits of Spotted Sandpipers. Illustrated by Lantern Slides and Motion Pictures. (33 minutes). THEODORA NELSON, *Hunter College of the City of New York.*

A discussion of certain recently observed details such as time of arrival on nesting grounds, distinction in plumage as well as in size between males and females, early spring behavior (*i. e.*, flocking, playing), mating and selection of territory, egg-laying and nest-building, and the behavior of the male at this time, time when female incubates, evidences of second nestings, decrease in the weight of eggs and its significance to one studying nests.

12. Behavior of the Murre in Relation to Gull Damage on the Nesting Ground. Illustrated by Motion Pictures. (26 minutes). R. A. JOHNSON, *State Normal School, Oneonta, New York.*

A colony was studied from a blind. Emphasis was placed on the psychology of behavior. Full paper to be published in the WILSON BULLETIN.

13. Sandhill Crane Studies in Michigan. Illustrated by Lantern Slides and Motion Pictures. (18 minutes). LAWRENCE H. WALKINSHAW, *Battle Creek, Michigan.*

The studies include observations on migration; the sizes of nests and the materials to be found in them; the sizes and weights of eggs and their decrease in weight during incubation; nesting dates; measurements, weights, and color of young; spring, summer, fall, and nesting behavior. A discussion of the probable future of the species is presented.

14. Tropical Birds. Illustrated by Motion Pictures Obtained during the Hancock Pacific Expeditions. (21 minutes). P. J. REMPEL, *University of Southern California.*

Excellent motion pictures showing the courting dance of the Galapagos Albatross, the Flightless Cormorants of Albemarle, the Boobies from Hood Island, and the Man-o'-war-bird, Flamingo, and Yellow-crowned Night Heron.

15. Bird Islands of Peru. Illustrated by Motion Pictures obtained during the Hancock Pacific Expeditions. (14 minutes). P. J. REMPEL, *University of Southern California.*

Remarkably fine motion pictures of the famous Guanayes nesting on some of the islands off of the Peruvian Coast.

TUESDAY MORNING

A SYMPOSIUM ON ALEXANDER WILSON

16. Alexander Wilson as an Ornithologist. (13 minutes). ALBERT F. GANIER, *Nashville, Tennessee.*

17. Alexander Wilson as a Poet. (21 minutes). GORDON WILSON, *Western Kentucky State Teachers College.*

The poetry of Wilson falls into two natural divisions, (1) that written in Scotland, and (2) that written in America; but all his work is related in being full of accurate observations of nature and also full of the good-humored, canny sense of the author. His most important Scottish poem is "Watty and Meg", which ranks with "Tam o' Shanter" in Scotland as a faithful picture of low life. The peddler poems, though not up to Wilson's standard as literature, are "episodes in an unwritten chapter of our history," the history of peddling. The satires against the manufacturers of cloth are part of the literature of the struggle between capital and labor and are interesting in the life of Wilson as being the immediate cause of his leaving Scotland for America. The three poems recited at the Pantheon were the means of introducing Wilson to the literary circles of Edinburgh, while one of them, "The Laurel Disputed", ranks with Wilson's best poems written in America.

Scattered all through his poems are references to nature that show Wilson's love of the out-of-doors and his accuracy of observation. His best nature poems written in Scotland are "The Disconsolate Wren" and "Lochwinnoch". Though Wilson wrote many poems after arriving in America, his best work is found in "The Invitation", "The Solitary Tutor", "A Rural Walk", the bird poems, and "The Foresters". Of these "The Foresters", his longest poem, represents most completely his ideas as a poet. The poem is a natural-history journey through typical American scenes and is designed to show a representative view of American life. All of his American poems are intimately connected with his journeys, his teaching days, and his masterpiece, the "American Ornithology". As a poet Wilson ranks in Scotland among the second group of poets, the one just below Burns and Ramsay; in America he had only one contemporary rival, Philip Freneau.

18. Alexander Wilson as an Artist. Illustrated by Lantern Slides. (37 minutes). GEORGE MIKSCH SUTTON, *Laboratory of Ornithology, Cornell University*

Wilson was the first man to undertake a more or less complete set of paintings of American birds, and while his drawings are to be considered charts rather than artistic designs, they are nevertheless of great scientific and historic interest. Not much concerning Wilson's problems and methods as an artist appears in his numerous letters, but we know that the engraver, Alexander Lawson, had a good deal to do with the appearance of the final plates.

It is a surprising fact that Wilson showed no particular bent toward bird drawing, or indeed toward any kind of drawing, during his childhood. Not happy as a weaver and as a peddler of fabrics, he came to America as a young man, did not succeed very brilliantly as a teacher, and suddenly, at the suggestion of his friend, William Bartram, turned to bird painting. The germ of the artist was there all the while, of course, but adverse circumstances and bitter disillusionment were required to develop it.

19. Variation in the Abundance of Birds in Northern Ohio. Illustrated by Lantern Slides. (22 minutes). S. Charles Kendeigh, *University of Illinois and Baldwin Bird Research Laboratory.*

A consideration of the following matters: (1) Yearly variations in the breeding population of the House Wren and other nesting birds at the Baldwin Laboratory, and in the wintering population of the Bob-white and common birds of forests and open country. (2) Yearly variations in respect to cycles and sunspots. (3) Differences in absolute abundance of birds with change in habitat. (4) Methods of calculating bird abundance using different census methods.

20. Factors Involved in the Economic Status of Predatory Birds. Illustrated by Lantern Slides. (21 minutes). Frederick M. Baumgartner, *Department of Conservation, Game Division, Michigan.*

Based on the study of the food habits of the Great Horned Owl. The economic status of this bird varies in the eastern and western parts of its range. In agricultural areas these owls eat injurious rodents, and balance the harm they do to poultry. Status of predators should not be decided until we are able to balance their good qualities against their harmful ones.

21. Nocturnal Bird Vocalization in a Beech-Maple Forest. (4 minutes). J. C. Plagge, *Department of Zoology, University of Chicago.*

The nocturnal vocal activities of birds were studied in a beech-maple forest near Smith, Indiana, May 29 and 30, 1937. The order in which various species of birds stopped singing in the evening and then began singing in the morning was determined.

22. Shore Birds Attracted to Streams Polluted with Sewage. (4 minutes). Edwin Lincoln Moseley, *Bowling Green State University, Ohio.*

Several kinds of shore birds on returning to Ohio after nesting farther north found good feeding grounds along a small stream just below where sewage entered. The birds continued to use these feeding grounds year after year until a sewage disposal plant was constructed and began operation. These birds have not since returned.

23. Social Hierarchy in the Canary. (20 minutes). Hurst H. Shoemaker, *Department of Zoology, University of Chicago.*

The relation between social hierarchy (peck order) and territory, breeding season, sex, and other factors is shown. Family organization within the flock is demonstrated. Comparison is made with social hierarchy in other species.

24 Individual and Specific Reaction to Color Among Birds. (16 minutes). A. L. Pickens, *Paducah Junior College, Kentucky.*

1. A geographic factor apparently figures in color in many families; for example, the luminous colors of the Trochilidae appear in sequence from polar to equatorial regions as if one were working around an artist's color wheel. 2. Some species appear to be influenced more strongly by certain colors in nature: other species by a different set, but the red side of the color wheel seems to best attract attention. 3. A difference, however, is indicated between individuals of the same species for some show a preference for red, others for a bluish violet, etc.

25. Does Castration Affect the Migration of Birds? (6 minutes). Harry W. Hann, *Zoology Department, University of Michigan.*

In the year 1933 and in 1934 the speaker carried out a series of experiments in the castration of male birds in an effort to find out, if possible, what effects it would have on their migration. The birds used were trapped at a banding station, operated on in the laboratory under an anesthetic, and released at the station usually on the following day. Both testes were removed from twenty-nine White-throated Sparrows, five Red-eyed Towhees, and three Slate-colored Juncos. Most of these birds remained around the station, coming into the

traps frequently for food until the incisions healed, then left. One Red-eyed Towhee returned two years later. The experiments indicate that the presence of testes is not necessary for the migration of male birds.

TUESDAY AFTERNOON

26. Experiments in Feather Marking of Tree Sparrows for Territory Studies. Illustrated by Lantern Slides. (26 minutes). A. MARGUERITE BAUMGARTNER, *East Lansing, Michigan.*

A comparison of the effectiveness of various dyes and color combinations experimented with in feathering Tree Sparrows at Cornell University and an analysis of the winter range of a flock of eighty-one winter birds marked so that individuals could be recognized in the field.

27. Birds of an Earthquake Lake. Illustrated by Colored Motion Pictures. (24 minutes). KARL H. MASLOWSKI, *Cincinnati Society of Natural History.*

The speaker in company with Peter Koch, of Cincinnati, spent several weeks in June, 1937, photographing and studying the birds of the Reelfoot Lake region of Tennessee. Beautiful motion pictures of such birds as the American Egret, Ward's Heron, Double-crested Cormorant, and Least Tern show many of the interesting results obtained.

28. Some Minnesota Birds. Illustrated by Colored Motion Pictures. (14 minutes). W. J. BRECKENRIDGE, *Museum of Natural History, University of Minnesota.*

A delightful series of motion pictures of such birds as the Least Bittern, Yellow-headed Blackbird, Pigeon Hawk, and Wood Duck.

29. An Ornithological Survey of Oklahoma. Illustrated by Colored Lantern Slides and Colored Motion Pictures. (24 minutes). GEORGE MIKSCH SUTTON, *Laboratory of Ornithology, Cornell University.*

John B. Semple, Karl W. Haller, Leo A. Luttringer, Jr., and the speaker made a state-wide survey of the bird life of Oklahoma during the spring of 1937. Beginning in the southeastern corner of the State they spent some time collecting in McCurtain County, the Arbuckle Mountains, the Wichita Mountains, Roger Mills County, Ellis County, the extreme Western Panhandle, the eastern edge of the Panhandle, and at several points in the northern and northeastern part of the State. They added several forms to the State List, found an amazing concentration of hybridization in the southwestern section, taking a series of what appeared to be hybrid orioles, some hybrid buntings, and other birds not easily identifiable because of intergradation. On May 21 the party was caught in a black-dust storm at Kenton.

30. Ornithological Work at Little America, Antarctica. Illustrated by Lantern Slides and Motion Pictures. (35 minutes). ALTON A. LINDSEY, *Biology Department, American University.*

An account of the ornithological work during the Second Byrd Antarctic Expedition. Particularly outstanding were the splendid motion pictures of the Emperor and Adélie Penguins and the Snow Petrels.

31. A Season with Camera and Microphone. Illustrated by Sound Motion Pictures. (31 minutes). ARTHUR A. ALLEN, *Laboratory of Ornithology, Cornell University.*

Six papers were read by title. They were:

Effects of Drouth on Wild Life. DOUGLAS E. WADE, *University of Wisconsin.*

Recent Observations on the Greenland Wheatear in Baffin Land. JOHN RIPLEY FORBES, *Ithaca, New York.*

Traveling with the Migrant Birds. FRED T. HALL, *Crawfordsville, Indiana.*

The Rôle of the Amateur in Bird Geography. JOSSELYN VAN TYNE, *Museum of Zoology, University of Michigan.*

1937 Explorations on the Missouri River. T. C. Stephens, *Morningside College, Iowa.*

A Unique Shorebird Population in Northern Ohio. Lawrence E. Hicks, *Ohio State University.*

The Annual Banquet

One hundred members and friends attended the Annual Banquet on Tuesday evening. President Josselyn Van Tyne served as toastmaster and introduced the four speakers of the evening. Dr. Lynds Jones, a Founder of the Club and for many years Editor of the Wilson Bulletin, told in a delightfully amusing manner some of the early struggles of the Club and many of the difficulties of financing and publishing the first numbers of the Bulletin. Dr. R. M. Strong, also a Founder of the Club and for many years its Secretary, spoke briefly on the progress being made with his bibliography of birds, an undertaking of no small proportions. It is gratifying to learn that a part of it is now in galley proof. Mr. Cleveland P. Grant, of the Baker-Hunt Foundation, showed some of his expertly taken motion pictures. Titled "Birds of Prairie and Woodland", they depicted intimate glimpses of such elusive birds as the Prairie Chicken, Ruffed Grouse, and American Woodcock. At a special request he presented his more recently taken film, "The Peregrines of Percé". Those persons present who had visited Percé Rock on the Gaspé peninsula appreciated many of the technical difficulties with which Mr. Grant was confronted while obtaining his remarkable shots of the Duck Hawk against a background of Gannets, Spotted Sandpipers, and Herring Gulls. Dr. Olin Sewall Pettingill, Jr., of Carleton College, showed a portion of his colored motion picture film, "The Birds of Machias Seal Island", featuring particularly the nesting habits and general behavior of the Arctic Terns and Atlantic Puffins.

Attendance

The total attendance at the Indianapolis meeting was the largest in the history of the organization, the next largest meeting being that of the Pittsburgh meeting in 1934 when 178 persons registered. Altogether 238 persons were present. They included 2 Founders, 84 members, and 154 visitors. The group photograph contained 81 of the persons in attendance.

Particularly pleasing was the large local attendance of 60 persons and the total Indiana attendance of 93 persons. Representatives from 26 states and the District of Columbia were present. Next to Indiana the state with the largest representation was Kentucky with 21 persons.

Thirty-five universities, colleges, and normal schools or teachers colleges were represented. They were:

Universities—American, Bowling Green State (Ohio), Chicago, Cornell, Georgia, Illinois, Iowa, Johns Hopkins, Loyola, Michigan, Minnesota, Missouri, Nebraska, Ohio, Ohio State, Purdue, Southern Methodist, Vanderbilt.

Colleges—Carleton, College of St. Catherine, Goshen, Hunter College of the City of New York, Morningside, North Dakota Agricultural College, Oberlin, Principia, Sweet Briar.

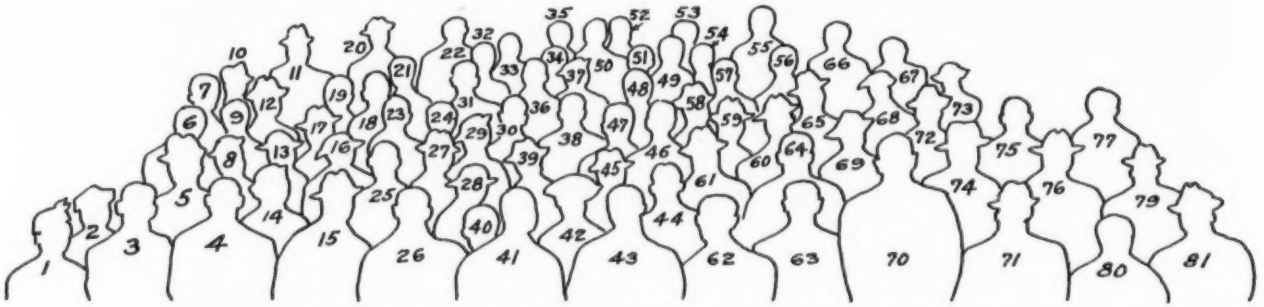
Normal Schools or Teachers Colleges—Concordia Teachers College, Western Kentucky State Teachers College, State Teachers College of Morehead, Kentucky, Western Michigan State Teachers College, State Normal School of Oneonta, New York, Asheville Teachers College of North Carolina, Peabody Teachers College of Tennessee.

The register of attendance follows:

From ARKANSAS: *Visitor*, 1. From CALIFORNIA: *Member*, 1—Mrs. H. J. Taylor, Berkeley. *Visitor*, 1. From COLORADO: *Visitor*, 1. From CONNECTICUT: *Member*, 1—Miss E. E. Wagner, Danbury. From GEORGIA: *Member*, 1—J. Fred Denton, Athens. From ILLINOIS: *Members*, 11—Margaret M. Nice, L. B. Nice, R. M. Strong, H. H. Shoemaker, Chicago; C. W. G. Eifrig, River Forest; A. F. Satterthwait, Mrs. A. F. Satterthwait, S. C. Kendeigh, Urbana; Mrs. C. I. Reed, Villa Park; G. B. Happ, Elsah; Miss M. A. Bennett, Macomb. *Visitors*, 8. From INDIANA: *Members*, 12—S. E. Perkins III, Mrs. L. G. Peavey, Miss M. R. Knox, Miss A. E. Taft, Indianapolis; Grant Henderson, Greensburg; S. W. Witmer, Goshen; L. A. Test, West Lafayette; L. L. Bohning, Knox; H. A. Zimmerman, Muncie; Mrs. H. P. Cook, Anderson; F. T. Hall, Crawfordsville; A. M. Grass, Linton. *Visitors*, 81. From IOWA: *Member*, 1—T. C. Stephens, Sioux City. *Visitor*, 1. From KENTUCKY: *Members*, 10—B. L. Monroe, J. B. Young, Miss Evelyn Schneider, Miss Mabel Slack, H. B. Lovell, Louisville; Gordon Wilson, Bowling Green; R. J. Fleetwood, Madisonville; W. A. Welter, Morehead; A. L. Pickens, Paducah; C. P. Grant, Covington. *Visitors*, 11. From MAINE: *Visitor*, 1. From MARYLAND: *Member*, 1—C. M. Herman, Baltimore. *Visitor*, 1. From MASSACHUSETTS: *Member*, 1—Miss Claudia Schmidt, West Springfield. *Visitors*, 2. From MICHIGAN: *Members*, 8—Josselyn Van Tyne, H. W. Hann, M. B. Trautman, Ann Arbor; M. D. Pirnie, Augusta; L. H. Walkinshaw, Battle Creek; F. M. Baumgartner, Lansing; R. E. Olsen, Pontiac; F. J. Hinds, Kalamazoo. *Visitors*, 7. From MINNESOTA: *Members*, 4—W. J. Breckenridge, K. D. Morrison, Minneapolis; Gustav Swanson, St. Paul; O. S. Pettingill, Jr., Northfield. *Visitors*, 7. From MISSISSIPPI: *Member*, 1—Miss F. A. Cook, Jackson. *Visitors*, 2. From MISSOURI: *Member*, 1—Rudolph Bennitt, Columbia. *Visitors*, 5. From PENNSYLVANIA: *Member*, 1—Miss M. L. McConnell, Pittsburgh. *Visitors*, 3. From NEBRASKA: *Member*, 1—G. E. Hudson, Lincoln. From NEW YORK: *Members*, 6—A. A. Allen, A. R. Brand, G. M. Sutton, R. L. Weaver, Ithaca; Miss Theodora Nelson, New York City; R. A. Johnson, Oneonta. *Visitors*, 5. From NORTH CAROLINA: *Member*, 1—Miss E. B. Finster, Asheville. From NORTH DAKOTA: *Member*, 1—O. A. Stevens, Fargo. *Visitor*, 1. From OHIO: *Members*, 9—L. E. Hicks, D. W. Jenkins, D. L. Leedy, Columbus; Victor Coles, K. H. Maslowski, Cincinnati; Lynds Jones, Oberlin; W. C. Baker, Salem; E. L. Moseley, Bowling Green; H. T. Gier, Athens. *Visitors*, 6. From TENNESSEE: *Members*, 5—A. F. Ganier, J. M. Shaver, G. R. Mayfield, Mrs. F. C. Laskey, Nashville; Miss C. C. Counce, Memphis. From TEXAS: *Member*, 1—Mrs. E. D. Cheatham, Dallas. *Visitors*, 2. From VIRGINIA: *Members*, 3—J. S. Y. Hoyt, Lexington; C. N. Crook, Jr., Williamsburg; Miss F. S. Hague, Sweet Briar. *Visitors*, 2. From WISCONSIN: Visitors, 3. From WYOMING: *Member*, 1—W. J. Scott, Cheyenne. *Visitor*, 1. From WASHINGTON, D. C.: *Members*, 2—Clarance Cottam, A. A. Lindsey. *Visitors*, 2.

Summary of Attendance: Total Registration, 238 (Members, 84; Visitors, 154). Total from Indianapolis, 60 (Members, 4; Visitors, 56). Total from Indiana, 93 (Members, 12; Visitors, 81). Total outside of Indiana, 145 (Members, 72; Visitors, 73). Maximum number at each program session: Monday morning, 75; Monday afternoon, 115; Tuesday morning, 113; Tuesday afternoon, 205. Number at the Annual Banquet, 100. Number of persons in group photograph, 81.

FIG. 16. Group at the Annual W. O. C. Meeting, Indianapolis, 1937.



KEY TO THE W. O. C. GROUP PHOTOGRAPH AT INDIANAPOLIS, 1937

1, Mrs. F. C. Laskey. 2, Dr. Cynthia C. Counce. 3, K. D. Morrison. 4, A. L. Pickens. 5, C. W. G. Eifrig. 6, Woodrow Goodpaster. 7, Peter Koch. 8, Constance Nice. 9, R. A. Johnson. 10, A. Marguerite Baumgartner. 11, G. B. Happ. 12, K. H. Maslowski. 13, Mrs. A. F. Satterthwaite. 14, Mrs. R. J. Fleetwood. 15, Willard N. Clute. 16, Mrs. H. J. Taylor. 17, W. C. Baker. 18, Gustav Swanson. 19, C. P. Grant. 20, S. E. Perkins III. 21, O. A. Stevens. 22, Leo Deming. 23, L. H. Walkinshaw. 24, Mrs. L. H. Walkinshaw. 25, R. J. Fleetwood. 26, L. E. Hicks. 27, F. J. Hinds. 28, Mrs. Lynds Jones. 29, Mrs. Victor Coles. 30, Victor Coles. 31, W. J. Breckenridge. 32, H. K. Gloyd. 33, G. E. Hudson. 34, M. B. Trautman. 35, John Frees. 36, F. C. Huggit. 37, Clara M. Moore. 38, A. A. Lindsey. 39, Theodora Nelson. 40, Mrs. A. D. Morse. 41, Lynds Jones. 42, Mrs. Margaret M. Nice. 43, R. M. Strong. 44, Frank Manz. 45, Emilie Yunker. 46, T. C. Stephens. 47, S. C. Kendeigh. 48, Clarence Cottam. 49, H. P. Cook. 50, H. H. Shoemaker. 51, Frank Johnson, 52, Robert McKinley. 53, Edwin Ross. 54, F. B. Ebersole. 55, F. T. Hall. 56, R. A. Huggins. 57, G. M. Sutton. 58, A. M. Grass. 59, H. W. Hann. 60, J. B. Young. 61, B. L. Monroe. 62, A. F. Ganier. 63, O. S. Pettingill, Jr. 64, Gordon Wilson. 65, Grant Henderson. 66, F. M. Baumgartner. 67, Mrs. H. H. Coburn. 68, Mrs. H. P. Cook. 69, Evelyn J. Schneider. 70, J. Van Tyne. 71, J. S. Y. Hoyt. 72, P. A. Davies. 73, Margaret R. Knox. 74, W. A. Welter. 75, D. L. Leedy. 76, A. R. Brand. 77, D. W. Jenkins. 79, M. D. Pirnie. 80, Mabel Slack. 81, A. A. Allen. Copies of this 1937 group photograph may be obtained for sixty cents each by addressing Mr. S. E. Perkins III, 709 Inland Building, Indianapolis, Indiana.

REPORT OF THE TREASURER FOR THE YEAR 1937

Receipts for 1937

Balance in Bank November 24, 1936		$ 581.02
From Membership Dues:		
Associate	$ 802.13	
Active	413.00	
Sustaining	160.00	
Total received from membership dues		1,375.13
From Subscriptions:		
Total received from subscriptions		119.64
Miscellaneous Receipts:		
Sale of back numbers of the Bulletin	37.00	
Contributions to publication fund	94.52	
Re-deposit of one returned check	5.00	
Total miscellaneous receipts		136.52
Total receipts, including old balance		$2,212.31

Disbursements for 1937

Printing four issues of the Bulletin	$1,215.96	
Cost of halftones, cuts, etc	128.06	
Other expenses in Editor's Office	81.71	
Total publication costs		$1,425.74
Expenses in Secretary's Office	165.74	
Expenses in Treasurer's Office	56.46	
Printing	131.14	
Refunds, miscellaneous costs, etc	37.84	
Total general costs		391.23
Total disbursements (itemized in report)		1,816.97
Balance on hand December 24, 1937		395.34
Total		$2,212.31

ENDOWMENT FUND

Total Endowment Fund, shown by Report on November 24, 1936		$1,479.59
Received during the past year:		
Interest coupons on U. S. Postal Savings 2½% Coupon Bonds due January 1, 1937, and July 1, 1937	19.50	
Interest received on amount on deposit in Fletcher Trust Company, Indianapolis, payable May 1, 1937, and November 1, 1937	.68	
Received from Leon Otley Pindar Estate, Bequest under the terms of his Will	843.88	
Total Endowment Fund as of December 24, 1937		$2,343.65

Including:

Bonds in safety deposit box of Fletcher Trust Company at Indianapolis in sum of	$1,455.00	
Balance in cash in savings account in the Fletcher Trust Company, Indianapolis	888.65	
		$2,343.65

Respectfully submitted,

S. E. PERKINS III, *Treasurer.*

Indianapolis, Indiana, December 24, 1937.

REPORT OF THE LIBRARIAN FOR THE YEAR ENDING OCTOBER, 1937

I have the honor to present herewith the seventh annual report of the Librarian of the Wilson Ornithological Club.

With the aid of Works Progress Administration workers I have been able to clean shelves and books and check the arrangement of the books on the shelf to insure more efficient service for the patrons of the library. Also we have rearranged the stock of the WILSON BULLETIN. We kept out as a working stock twenty-five numbers, or less if there were not that many, and are storing the remainder in cartons. We were able to enlarge the storage space for other Museum publications in this way.

PUBLICATIONS: During the past year the library has continued to receive Natural History, a journal of the American Museum, Bird-Lore, Archives Suisses d'Ornithologie, and Proceedings of the Iowa Academy of Science.

EXCHANGES: We have been able to get some of the older numbers of the WILSON BULLETIN by exchanging the later numbers for the Bulletin. We have also received as a gift some of the numbers of the Bulletin, especially the older ones.

SALE OF THE BULLETIN: There have been a large number of requests asking about the price of the Bulletins. It would seem to indicate that individuals and libraries are sensing the importance of having complete sets of the Bulletin on their shelves. As yet there has been no large sale. There do not seem to be enough requests for any one number to justify the reprinting of the out of stock numbers.

GROWTH: The library continues to grow. We received this past year two bound volumes and 113 unbound pieces of material plus the periodicals listed above.

DONORS: There have been a large number of gifts this past year. A list of the donors follows: Leon Kelso, Washington, D. C.; G. E. Hudson, Lincoln, Nebraska; Ralph Beebe, Ecorse, Michigan; Stuart T. Danforth, Puerto Rico; Samuel M. Herriott, New York, New York; George M. Sutton, Ithaca, New York; Paul L. Errington, Ames, Iowa; Francis Harper, Swarthmore, Pennsylvania; Harriet Williams Myers, Los Angeles, California; Norman Asa Wood, Ann Arbor, Michigan; O. A. Stevens, Fargo, North Dakota; L. Roy Hastings, Seattle, Washington.

Respectfully submitted,

F. RIDLEN HARRELL, *Librarian.*

REPORT OF THE SECRETARY FOR 1937*

To the Officers and Members of the Wilson Ornithological Club:

On March 1, 1937, the Secretary received from his predecessor in office, Dr. Lawrence E. Hicks, official correspondence obtained during the latter's five years of service together with the membership card files, newly printed stationery, and other necessary materials. In addition, Dr. Hicks presented him with a well thoughtout work-book wherein the monthly secretarial duties were concisely outlined. Thus, as far as the Secretary is aware, the office has continued to function through the year in an unbroken pace.

*Revised through December 31, 1937.

A major part of the Secretary's duties during the year has been concerned with the solicitation of members. His office has sent out 2300 letters largely to persons enrolled as members of other natural history organizations. Approximately 150 of these letters have been sent to likely candidates at the direction of our own members. The Secretary has not been alone in this important work of membership solicitation. Dr. Hicks kindly volunteered his services in sending out 600 additional letters while other officers and members have gone out of their way to contact interested persons. Altogether the number of membership solicitation letters sent out by the Wilson Ornithological Club approaches 3,000.

This year 150 new members have been obtained, 4 are classified as Sustaining, 17 as Active, and 129 as Associate Members. During the year 76 members have dropped out, either by death or failure to pay dues. We have thus had a net gain in membership of 74 members. We now have 838 members classified as follows: Honorary, 5; Life, 9; Sustaining, 41; Active, 187; Associate, 596.

The total distribution of members by states, provinces, and foreign countries is given below. The figures in parentheses indicate the number of members *new* to the organization in 1937.

Alabama	1	New York	54 (13)
Arizona	6 (1)	Ohio	100 (17)
Arkansas	4 (2)	Oklahoma	7 (2)
California	47 (4)	Oregon	6
North Carolina	7 (1)	Pennsylvania	34 (11)
South Carolina	2	Tennessee	23 (5)
Colorado	8 (1)	Texas	19 (2)
Connecticut	7 (2)	Utah	8 (1)
North Dakota	11 (3)	Virginia	18 (3)
South Dakota	5	West Virginia	9 (2)
Delaware	3	Vermont	1
Florida	5	Washington	5 (3)
Georgia	11 (1)	Washington, D. C.	25 (2)
Idaho	3 (1)	Wisconsin	32 (6)
Illinois	56 (5)	Wyoming	5 (1)
Indiana	27 (8)		
Iowa	39 (4)	Alberta	1
Kansas	7 (2)	British Columbia	3 (1)
Kentucky	15 (1)	Manitoba	5 (1)
Louisiana	11 (3)	Ontario	20 (5)
Maine	7	Quebec	3
Maryland	10 (3)	Saskatchewan	1
Massachusetts	32 (9)	Cuba	1
Michigan	51 (6)	England	1
Minnesota	28 (7)	Finland	1
Mississippi	4 (3)	Germany	1
Missouri	22 (2)	Holland	1
Montana	5 (1)	Italy	1
Nebraska	12 (1)	New Zealand	1
New Hampshire	4	Porto Rico	1
New Jersey	12 (3)	Switzerland	1 (1)
New Mexico	7	Virgin Islands	1

The total figure of 838 members for 1937 is lower than the total figure for 1936. This difference is due not to any loss of membership, for we have actually gained members. It is due to the fact that only paid-up members are included. The total figure of 906 members for 1936 included 123 non-paying members for that year.

Another part of the Secretary's duties has been concerned with correspondence with members. Early in October a post card announcing briefly the Annual Meeting was sent to 600 members residing in the Mississippi Valley and neighboring states. Later in November the annual letter to all members was placed in the mails. This letter contained the following enclosures: a "Christmas Suggestion", a detailed announcement of the Annual Meeting, an application blank for hotel accommodations and program positions, a three-page questionnaire, a nomination blank, and a return envelope. The number of responses to these enclosures may be of interest.

Five members gave an Associate Membership for Christmas. The number of applications returned was 48. In these applications 47 program positions were requested requiring altogether 804 minutes. The number of questionnaires returned was 240. The number of nomination blanks returned was 56 with 162 persons listed.

The arrangement of the present program of the Annual Meeting has been entrusted to the Secretary. This third part of his duties has been not only a terrific responsibility but has proved to be both a heartache and headache. He has had to ask many members to shorten the times needed to present their papers and to take positions on the program that they did not prefer. Worst of all he has had to relegate some papers to alternate positions and omit others. This unhappy task has been due to the great number of requests for program positions and the relatively short space of time during each of the four sessions. Actually the sessions total only 480 minutes and 804 minutes were requested!

The Secretary could not fail to be impressed with the sincerity and care with which the members filled out the questionnaires. He now has before him a wealth of valuable opinions and criticisms of the Wilson Ornithological Club and its official organ, the Wilson Bulletin. The substance of these questionnaires will be reported fully in a forthcoming Bulletin. On reading this material you will agree with the Secretary that the venture of submitting questionnaires to members has been worthwhile.

At this time the Secretary wishes to express appreciation to those members who nominated for membership numerous persons interested in birds and to the members below who obtained new members:

Ben B. Coffey, Jr.—4 members. Miss Mabel Slack and Miss Pirna M. Stine—2 members each. C. W. G. Eifrig, G. B. Spawn, F. M. Baumgartner, Miss Theodora Nelson, R. B. Wallace, M. B. Skaggs, Gordon Wilson, Maurice Brooks, W. C. Starrett, M. E. Foote, K. D. Morrison, G. M. Sutton, S. P. Jones, M. R. Knox, F. A. Stebbins, K. E. Bartel, Robert Overing—1 member each.

The Secretary wishes to express his appreciation also to his fellow officers who were responsible for obtaining 66 of the 150 new members.

Respectfully submitted,

Olin Sewall Pettingill, Jr., *Secretary.*

December 27, 1937.